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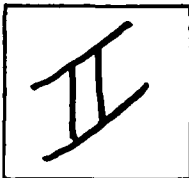
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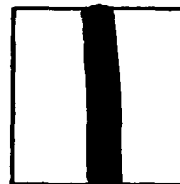
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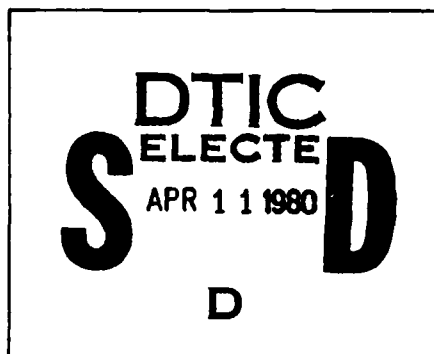
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TASK ANALYSES OF THREE SELECTED WEAPONS SYSTEMS

Theodore R. Powers and Michael R. McCluskey
Human Resources Research Organization

UNIT TRAINING AND EVALUATION SYSTEMS TECHNICAL AREA



U. S. Army

Research Institute for the Behavioral and Social Sciences

October 1976

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TASK ANALYSES OF THREE SELECTED WEAPONS SYSTEMS

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TASK ANALYSES OF THREE SELECTED WEAPONS SYSTEMS

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TASK ANALYSES OF THREE SELECTED WEAPONS SYSTEMS

INTRODUCTION

The research reported here is part of a broader program on simulation conducted by the Unit Training and Evaluation Systems Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI). Training simulators reduce demands on limited resources and promise greater efficiency in both training and testing. However, no experimental evidence had compared performance resulting from simulator vs. live-fire training. The overall objective of Project DRAGON (LIVEFIRE) was to determine the contribution of live firing of large caliber weapons to weapons proficiency. To achieve this objective, three separate but sequentially linked tasks were accomplished by ARI and the Human Resources Research Organization (HumRRO).

The first task analyzed present weapons training and training devices in the context of the total Army training system, through review of training documentation, relevant research, military literature, observation of training practices, and discussions with cognizant military personnel (McCluskey, Haggard, and Powers, 1976). Topics in the report included instructional content, instructional techniques, weapons training devices (simulators), training management, and resources required to support training.

The second task was to conduct task analyses to identify the critical performance requirements for three selected weapons systems, and to identify the commonalities and differences in tasks within the three major weapons systems and other weapons of a similar but somewhat different nature. The three weapons used in Task 2 were:

- (1) The M60A1 Tank. This tank is armed with a 105mm main gun and is currently the main battle tank for the U.S. Army. Other weapons in the same general family are the newer M60A2 Tank and the M551 Armor Reconnaissance/Airborne Assault Vehicle (AR/AAV).
- (2) The 155mm Howitzer--Self Propelled (SP). This is one of the principal artillery supporting weapons for the combat arms. Other weapons in the same general family are the 105mm Howitzer (Towed), the 155mm Howitzer (Towed), and the 8-Inch Howitzer (SP).
- (3) The 81mm Mortar. This is the principal supporting mortar used at platoon and company level. The only other weapon currently available in this family is the 4.2-Inch Mortar.

This report discusses the results of the Task 2 research. Topics include identification of mission profiles, development of task inventories, administration of the task inventories to job incumbents, and analyses of the results.

The third and final task was to use the collected information to develop and conduct two field exercises to determine the contribution of live firing to weapons proficiency. The weapons used in Task 3 were the M60A1 Tank and the 155mm Howitzer (SP), and the results of the field tests have been reported by Powers et al. (1975).

RESEARCH APPROACH

The first step in Task 2 was to identify information about the three major weapons systems that were the focus of this phase of the research. In this systems analysis approach all component parts of the system must be identified. The behavior of individuals using weapons is a joint function of the specific weapon system, the goals (missions) of the system, and the environment in which it is used. The first step in identifying relevant tasks was, therefore, a comprehensive identification of the purposes for which a weapon may be used, weapon characteristics, and environmental characteristics.

Using this information from the systems analyses, the next step was to develop task inventories for the three selected weapons systems. Because of their previous research and expertise in certain areas, HumRRO Division No. 2, at Fort Knox, Kentucky, developed the task inventories for all jobs of the M60A1 Tank. HumRRO Division No. 4, at Fort Benning, Georgia, developed the task inventories for the 81mm Mortar and the 155mm Howitzer (SP) with the aid of several trips made to the Artillery School at Fort Sill to gather information, although HumRRO had previous experience with this weapon (McCluskey, Jacobs, and Cleary, 1974).

These task inventories were then given to a number of job incumbents at various locations and were also administered to job incumbents for the six peripheral weapons systems. This was done to identify commonalities and differences within and among similar and different type weapons.

The resulting data are extensive and complex. These data are included in tables in this report and the appendixes. Task inventory data were reduced by computer, using the CODAP 360 JOBDEC method of task analysis. Computer printouts in the appendixes list each individual task, in rank order, for each critical job, in each of the weapons systems.

IDENTIFICATION OF MISSION PROFILES AND RELATED INFORMATION

As the first step, system characteristics were delineated. This ranged from such basic data as the identification of number of personnel

and type of job for each man in a weapons system to significantly more complex factors such as the types of fire missions that would normally be appropriate for each weapon.

The purpose was to identify the general activities required for effective employment of the weapon, and the significant factors within the total system that may impact upon these activities. Information was obtained on:

- (1) Identification of typical fire missions.
- (2) Specification of the firing environments by type of mission.
- (3) Specification of the major system components (personnel, firing techniques, specific equipment), including interaction between other major system components (e.g., for Artillery, Forward Observers, and Fire Direction Centers).
- (4) Identification of fire mission profiles which state general job functions for each type of typical mission.

Documentary sources such as Field Manuals, Technical Manuals and Service School publications were surveyed, to update and verify the extensive knowledge and experience in the weapons area that existed within the HumRRO research team. Discussions with Service School personnel then verified the information that had been collected. For Infantry and Armor weapons, direct coordination was made by the HumRRO Divisions located near the Schools. For Artillery, information was gathered on a trip to Fort Sill.

Field experience data obtained in discussions with Service School personnel were compared to current doctrine to establish and assess the practical implications of live firing with large caliber weapons. Field experience data were also obtained by refining information that had been previously collected by HumRRO Work Unit ACTION which had collected combat information data on weapon use by making on-site visits to units in Vietnam (Magner, 1967).

This mission profile information was analyzed and stored for eventual use in the development of task inventories. Appendix A shows an example of the types of information identified for one weapons system.

The systems analysis laid a sound basis for the development of task inventories. For example, mission profiles for the 155mm Howitzer (SP) had identified significant task differences that depended on whether the gun was firing direct or indirect fire. This finding required the development of task inventories that separated the tasks into these two categories. Without this prior information, a single task inventory would probably have been developed that could have caused confusion among the job incumbents.

Additionally, the use of mission profiles enabled the research team to identify major potential problem areas. For example, the systems analysis clearly indicated that the Forward Observer (if used) and the Fire Direction Center were significant variables in the accurate firing of large caliber Artillery weapons. Thus, those variables would have to be held constant, or controlled in some way, if the weapons proficiency of individual crews was to be established. Awareness of this potential problem area enabled the research team to design the Artillery Field Test plan accordingly. Other types of information collected were used in equally significant ways, as the research team began the task analysis.

DEVELOPMENT OF TASK INVENTORIES

The mission analyses had identified all jobs and positions within the three selected weapons systems and specified the jobs critical to live firing within these systems. Critical jobs were defined as those performed by personnel directly adjacent to, and an integral part of, the sighting, loading, aiming, and firing of a weapon. The jobs for each weapons system are shown in Table 1.

For critical jobs, an in-depth job analysis was performed. Lengthy task inventories (up to 54 tasks) were developed for each position, with each task being written at a relatively specific level. For peripheral jobs, smaller inventories were developed (up to 20 tasks) with the individual tasks described more generally. In all cases, task inventories were limited to the weapon's live-firing activities.

Task inventories for all jobs, peripheral or critical, were developed in the following sequence. First, tentative draft lists were developed, using the following sources of information:

1. Job information collected during the development of mission profiles.
2. Army training documents such as Field Manuals, Technical Manuals, and Service School (Armor School, Artillery School, Infantry School) publications.
3. Expert opinion of Service School committee members.
4. The results of previous research conducted on these weapons.
5. The expertise of HumRRO personnel (including many retired Army officers) who have worked on previous weapons projects.

Table 1

CREW MEMBERS FOR THREE WEAPONS SYSTEMS

System: M60A1 Tank

Critical Jobs

Tank Commander

Gunner

Loader

Peripheral Jobs

Driver

System: 155mm Howitzer (SP)

Critical Jobs

Chief of Section

Gunner

Assistant Gunner

No. 1 Cannoneer

Peripheral Jobs

Cannoneers 2,
3, 4, 5, and 6

Driver

System: 81mm Mortar

Critical Jobs

Squad Leader

Gunner

Assistant Gunner

1st Ammunition Handler

Peripheral Jobs

2nd Ammunition
Handler

These draft inventories were informally reviewed by current or former job incumbents, or by experts in the pertinent area. In most cases, these individuals were with the Combat Arms Training Board, 197th Infantry Brigade, and the Infantry School at Fort Benning, and the 194th Armor Brigade and the Armor School at Fort Knox.

The draft inventories were revised to reflect comments received, and were then given a pilot test by having a limited number of job incumbents for each position complete the forms. These personnel were from various Armor units at Fort Knox, and from Infantry and Artillery units at Fort Benning. Based on the results of the pilot test, final inventories were developed. An example of these inventories is shown in Appendix B.

The format of all inventories was exactly the same. Only the task content differs as required by the job or weapons system. The response scale is a modification of the one originally developed by Hemphill (1959) and later used extensively by the U.S. Air Force in a number of job surveys (Morsh, 1963; Morsh and Archer, 1967). HumRRO has successfully used this scale in many recent task analysis projects, including the revision of the curriculum of the Coast Guard Academy (Powers et al., 1974). The scale is shown in Table 2.

Table 2
RESPONSE SCALE FOR TASK ANALYSIS

Alternative	Value
(Incumbent marks a line through the task to indicate that the task is <u>not</u> a part of his job.)	(0)
INSIGNIFICANT part of my job	1
SOMEWHAT SIGNIFICANT part of my job	2
MODERATELY SIGNIFICANT part of my job	3
SIGNIFICANT part of my job	4
HIGHLY SIGNIFICANT part of my job	5

Job incumbents were instructed to read each task on a list. If they never were responsible for a particular task in their current duties, they were instructed to draw a line through the task; the task would be scored as a zero. If the respondent did accomplish a particular task, they responded appropriately, using the scale shown in Table 2. The use of a single response scale combines task attributes (such as criticality, time spent, and difficulty) and allows tasks to be ordered as to job importance along a single dimension.

ADMINISTRATION OF TASK INVENTORIES

ARI and HumRRO had originally planned that only troop units in the continental U.S. (CONUS) would be surveyed during this project. However, although adequate numbers of Armor and Artillery crews were available within CONUS, there was a shortage of 81mm Mortar crews. Therefore, the CONUS surveys of Armor and Artillery crews were done by HumRRO personnel, while ARI arranged to gather mortar crew data in Europe. The jobs, number of personnel surveyed, unit, and location are shown in Table 3.

In addition to the task analysis to be used in the later field test, a survey of "commonalities and differences" had been requested for common and different weapons within a particular weapons system. A practical difficulty arose during this specific phase because the Army reduced the number of weapons within systems. For example, the 175mm Howitzer (SP) is being phased out of the Artillery inventory. This reduction limited the number of weapons available for survey.

A corollary problem appeared in the Armor portion of the survey, where the M60A1 is the main battle tank. A new tank, the M60A2, is coming into the inventory and thus could be used as the common weapons system; a new AR/AAV, the M551, was available for the different weapons system. However, since both the M60A2 and the M551 are relatively new systems, very few experienced crews were available to the research staff. The common and different weapons, units surveyed, jobs, and number of personnel are shown in Table 4.

ANALYSIS OF THE RESULTS

DESCRIPTIVE STATISTICS

Appendix C presents descriptive statistics for personnel participating in the task analyses. Table C-1 shows the number of personnel, by rank, in each of the three major weapons systems. Table C-2 shows the number of personnel, by months of duty, in each weapons system, and Table C-3 shows the amount of combat for personnel in each weapons system. M60A1 personnel seem to be generally higher in rank, have more experience in their jobs, and have more combat experience than personnel in the other two systems.

Table 3

PERSONNEL USED IN TASK ANALYSES

Location	Units	Jobs	No. Surveyed
<u>M60A1 Tank</u>			
Fort Knox	194th Armor Brigade	Tank Commander	44
	Armor School	Gunner	44
		Loader	44
		Driver	19
<u>155mm Howitzer (SP)</u>			
Fort Hood	1st Cavalry Div.	Chief of Section	33
	2nd Armored Div.	Gunner	29
Fort Benning	197th Infantry Brigade	Assistant Gunner	23
		No. 1 Cannoneer	24
		Group - Cannoneers	40
		2-6 and Driver	
<u>81mm Mortar</u>			
Europe	1st Armored Div.	Squad Leader	37
	1st Infantry Div. (FWD)	Gunner	43
	3rd Infantry Div.	Assistant Gunner	19
		1st Ammunition Handler	5
		2nd Ammunition Handler	16
Fort Benning	197th Infantry Brigade	Squad Leader	8
		Gunner	6
		Assistant Gunner	10
		1st Ammunition Handler	2
		2nd Ammunition Handler	0

Table 4

COMMON AND DIFFERENT WEAPONS SYSTEMS

Location	Units	Jobs	No. Surveyed
<u>Reference system: M40A1 Tank</u>			
<u>Common System: M40A1 Tank</u>			
Fort Knox	14th Armor Brigade	Tank Commander	5
		Gunner	3
		Loader	5
<u>Different System: M41 AR/AAV</u>			
Fort Knox	14th Armor Brigade	Commander	3
		Gunner	3
		Loader	3
		Driver	3
<u>Reference system: 105mm Howitzer SP</u>			
<u>Common System: 105mm Howitzer Towed</u>			
Fort Hood	1st Cavalry Div.	Chief of Section	4
	2nd Armored Div.	Gunner	1
		Assistant Gunner	1
		No. 1 Cannoneer	1
		Group - Cannoneers - and Driver	10
<u>Different System: 105mm Howitzer SP</u>			
Fort Hood	1st Cavalry Div.	Chief of Section	4
	2nd Infantry Div.	Gunner	3
		Assistant Gunner	3
		No. 1 Cannoneer	4
		Group - Cannoneers - and Driver	10
<u>Different System: 105mm Howitzer Towed</u>			
Fort Benning	19th Infantry Brigade	Chief of Section	6
	1st Cavalry Div.	Gunner	1
	2nd Armored Div.	Assistant Gunner	5
		No. 1 Cannoneer	6
		No. 2 Cannoneer	7
<u>Reference system: 81mm Mortar</u>			
<u>Common System: 4.2-Inch Mortar</u>			
Fort Benning	19th Infantry Brigade	Squad Leader	10
		Gunner	7
		Assistant Gunner	2
		1st Ammunition Handler	0
		2nd Ammunition Handler	5
<u>Different System: None Available</u>			

TASK ANALYSES OF THREE WEAPONS SYSTEMS

Appendix D presents the detailed results of the task analyses of the M60A1 Tank, the 155mm Howitzer (SP), and the 81mm Mortar. These data were analyzed using the CODAP 360 JOBDEC method of data analysis originally developed by the U.S. Air Force (Christal, 1970). JOBDEC develops several types of information, such as the percentage of respondents performing a given task and the percentage of the job that is encompassed by any given task. Primarily, the JOBDEC method of analysis is a mathematical/statistical tool for ranking the tasks comprising a job, from the most important tasks to the least important.

Thus, to interpret the task inventories in Appendices D and E, it is only necessary to read from top to bottom (task order is indicated by the numbers in the right hand column) to determine which tasks the respondents consider to be most important (the top third of an inventory), of intermediate importance (the middle third of an inventory), and least important (the bottom third of an inventory).

Information of this type is often used by curriculum planners to identify the tasks that should be emphasized the most in a program of instruction (usually the highest ranked ones) and which tasks need not be emphasized (usually the lowest ranked ones). The ranked task inventories are used to directly support the Task 3 field tests.

DETERMINATION OF COMMONALITIES AND DIFFERENCES AMONG WEAPONS SYSTEMS

Some of the limitations of determining commonalities and differences for these particular weapons systems have been discussed. When the results of this phase were obtained, other problems were identified. For example, there was little difference among some of the jobs in the systems, but great differences among others. Thus, the observations presented here are not comparisons of the various weapons, per se, but rather comparisons of specific jobs across weapons systems.

Appendix E presents the detailed results of the task analyses of the M60A2 Tank, M551 AR/AAV, 105mm Howitzer (Towed), 8-Inch Howitzer (SP), 155mm Howitzer (Towed), and the 4.2-Inch Mortar. These data were also analyzed using the CODAP 360 JOBDEC method of computer analysis. Thus, these results can be interpreted in the same manner as those in Appendix D if task ranking is the important variable.

If determining commonalities and differences across jobs and weapons is important, specific comparisons must be made between lists. This was accomplished by arbitrarily using the top one-third of the tasks on each list (a commonly used cut-off point). With longer lists and larger numbers of respondents, a more refined breakout would have been possible. However, given the available data, this is an appropriate analysis procedure. Each top third of a list was then compared with each top third of each other list, for all weapons within the general weapons system. This was accomplished for each critical position. The percent

of overlap between task lists (positions) was then computed; the results are shown in Table 5.

To further identify the specific tasks that are "common," an asterisk has been placed beside certain tasks in Appendix D, indicating that the task is common to all weapons within one of the three systems. Contrary to the results presented in Table 5, relatively few tasks are common across all weapons in a system. Tasks not marked with an asterisk are, of course, not common to all weapons.

Commonality, as used here, means appearance in the top one-third of a task list for each of several positions. Since the research procedure was to use exactly the same task inventories for all weapons within a particular system, a specific task will always appear somewhere on all task lists. The relative positions of these tasks on the lists is of critical importance for this study and is the basis for determination of "commonality."

DISCUSSION

ASK ANALYSES OF THREE WEAPONS SYSTEMS

The task analyses of the M60A1 Tank, the 155mm Howitzer (SP), and the 81mm Mortar give valuable and necessary information. Since this information was gathered directly from job incumbents, it presents an accurate picture of procedures currently in use in many Army units.

The components of each system were identified, and, by assessing the results of the analysis for each job, an excellent picture of job requirements was obtained. Although the research team had extensive experience with the Tank and Infantry systems, the Artillery system was relatively unfamiliar. Thus, the task lists were used as a detailed orientation on a particular weapons system.

The task lists were used to support work on the final phase of the projects, the field tests involving two of the three weapons systems--the M60A1 Tank and the 155mm Howitzer (SP)--in the conduct of the live-firing exercises. The task lists for these two weapons systems have been extensively reviewed, and various types of checklists and safety information have been developed from them. For example, by identifying which major tasks were ranked by the job incumbents as most important, Procedural Checklists have been developed for evaluators to use during live-firing exercises (e.g., Chief of Section--Checks position of replenisher tape indicator and recuperator).

Safety Checklists have also been developed from the task lists (e.g., Chief of Section--Repeats fire commands to keep crew informed of status of action). These checklists are also used by evaluators in the field study and may provide valuable information. During the first two phases of this study, troop commanders often commented that if troops were not accustomed to handling live ammunition, safety habits would be one of the first behavior patterns to degrade to a less than optimal level.

Table 5

COMMONALITIES AND DIFFERENCES WITHIN WEAPONS SYSTEMS

Job	Overlap	Overlap	Overlap
Reference Weapon			
<u>155mm Howitzer (SP)</u>	<u>155mm How (Towed)</u>	<u>8-in How (SP)</u>	<u>105mm How (Towed)</u>
Chief of Section	64%	55%	45%
Gunner	69%	46%	54%
Assistant Gunner	44%	67%	56%
No. 1 Cannoneer	33%	33%	33%
Reference Weapon			
<u>M60A1 Tank</u>	<u>M60A2</u>	<u>M551</u>	
Tank Commander	69%	69%	
Gunner	42%	67%	
Loader	27%	45%	
Reference Weapon			
<u>81mm Mortar</u>	<u>4.2-in Mortar</u>		
Squad Leader	(Task inventory too small to make meaningful comparison)		
Gunner	73%		
Assistant Gunner	40%		
1st Ammunition Handler	(No incumbents available)		

Finally, by establishing which crew member is responsible for a particular action, proper team cooperation can be assessed. Here a difference may exist between the weapons systems. The Tank System has a crew of four, only three of whom are directly involved in the firing. The Artillery System has a large crew of 10, with possibly nine of them directly involved in sustained firing although only four are in the turret at any one time. Thus, there may be hidden but inherent differences between these two weapons systems.

This task analysis information may interest the Service Schools that support the particular weapons systems. For instance, curriculum planners often use information of this type in curriculum development. The information in Appendix D might interest appropriate Service School personnel.

ASSESSMENT OF COMMONALITIES AND DIFFERENCES AMONG WEAPONS SYSTEMS

This phase of the research was beset with many practical problems, not all of which were overcome. The major problem was that a relatively small number of crews were available for assessment for some of the peripheral weapons systems (e.g., M60A2 Tank). Thus, the results in this area should be considered tentative until substantiated by additional research.

Table 5 shows that there is significant task overlap for some jobs in each of the systems. Often, though not always, those jobs that are more leader oriented (e.g., Tank Commander or Chief of Section) seem to have greater overlap than those jobs that are more technically based (e.g., Loader or No. 1 Cannoneer). Logically, leadership skills (e.g., Designates specific targets) maybe more general in nature than specific technical skills (e.g., Installs coaxial machinegun) which may apply only to a particular type of weapon.

Table 5 also indicates that, for the Artillery System, the 155mm Howitzer (SP) is more similar to the 155mm Howitzer (Towed) than it is to the 8-Inch Howitzer (SP) or 105mm Howitzer (Towed). This is in the expected direction. The 81mm Mortar seems to be similar to the only other mortar available for comparison. However, the comparison of the three tanks does not show as clear a picture. The small number of tank crews for the M60A2 and M551 may have significantly limited these specific data.

SUMMARY

Task inventories were developed for the M60A1 Tank, the 155mm Howitzer (SP), and the 81mm Mortar and were used with six comparable weapons systems. All task inventories were administered to job incumbents, and the results of the three major task analyses were used in direct support of the final phase of this project. A comparison of the three major systems with the six comparison systems identified commonalities and differences in task requirements for critical crew members across systems and found that leader positions have more generalizable skills across systems than do the more technical crew jobs.

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E. Ranked Task Inventories for the M60A2 Tank, M551 AR/AAV, 105mm Howitzer (Towed), 155mm Howitzer (Towed), 8-Inch Howitzer (SP), 4.2-Inch Mortar	61

APPENDIX A MISSION PROFILE INFORMATION FOR THE M60A1 TANK

FIRE MISSION ANALYSIS (TANK COMBAT, FULL TRACKED, 105MM GUN, M60A1)

1. Description and purposes of the weapons system: A heavy fully armored combat vehicle providing mobile fire power and crew protection for offensive combat armed with one 105mm gun, one cal .50 machinegun, and one cal .30 machinegun. Its purpose is:

- a. To destroy targets
 - (1) Hard targets -- enemy armor
 - (2) Soft targets -- enemy wheel and other unarmored vehicles
 - (3) Troops -- individuals and those manning crew-served weapons
- b. Defend or protect an area or position.

Environments:

a. Weather. The primary effects of weather on the operation of the M60A1 Tank are visibility and trafficability. The basic meteorological elements affecting operations are wind (speed and direction), temperature, humidity, cloud cover, precipitation, and atmospheric stability (inversion, lapse, and neutral conditions). In planning of operations with the M60A1 Tank, adverse weather conditions should be considered; often the success gained during unfavorable weather offsets the limitations and difficulties imposed by soil trafficability and slow rate of movement.

(1) Day: In clear weather the M60A1 Tank can successfully engage targets out to 2500-3000 meters, limited by the capability of the crew.

(2) Night: Night vision devices, both white and pink light mounted on the tank, permit engagement of targets.

(3) Rain, fog, snow and other forms of precipitation may limit the visibility of the crew and thus influence the effectiveness to engage targets under those conditions.

b. Terrain. The M60A1 Tank has good off-road trafficability and will cross most terrain that will support the 53-ton vehicle where no major obstacles exist. Its ground pressure is 11.1 PSI.

(1) Trafficability: It can travel up to 30 MPH on improved roads and has a cruising range of 160 miles. The vehicle will ford streams 48 inches deep, without the addition of fording kits. With the addition of fording kits, streams up to 162 inches may be forded if the stream bed is solid.

(2) Obstacles: The tank will climb vertical obstacles 36 inches high and will span a ditch 102 inches wide.

c. Enemy. The enemy capability to counter the employment of the M60A1 is of vital concern to the tank unit leader.

(1) Acquisition: In addition to the usual ground means of target acquisition available to the enemy, the M60A1 Tank is a high-priority target for enemy tactical air forces.

(2) Threat: In order to counter the threat, the cal .50 machinegun mounted on the tank and Red-Eye air defense teams provided for the tank company protection should be utilized. All forms of deception, cover, concealment, dispersion, and particularly frequent displacement of the tank are important.

(3) Intensity: Intensity of the enemy threat to the tank is determined by the number and type of weapons in possession of, and available to, the enemy. Characteristics of enemy weapons, such as range, rate of fire, mobility, and effectiveness of enemy weapons against the M60A1 Tank are of great importance to the tank commander.

3. Behavior of operating personnel of the M60A1 Tank.

(1) Crew: The tank crew must accept being separated from other friendly units. Maintenance and supply for both personnel and equipment assume major proportions in tank warfare. Although the most striking features of the M60A1 Tank are its powerful weapons and its mobility and shock effect, the successful employment of these material assets in combat depends ultimately on the courage, intelligence, and professional competence of the crew.

(2) Individual. The individual soldier of a tank crew, although proficient in his crew duty, must also be indoctrinated with the spirit of the offensive. His thinking must be geared to the speed and violence of tank warfare.

(3) Local environment: The crew must be trained to operate deep in hostile territory, and to recognize that the presence of the enemy to the front, flanks, and rear is a condition to be expected.

4. Pre-combat checks.

- a. Conduct necessary operational (crew) maintenance
- b. Top off fuel tanks
- c. Check basic load of ammunition
- d. Check basic load of Class I supplies

- e. Check basic load of spare parts
- f. Boresight 105mm gun
- g. Boresight .30 cal coaxial machinegun
- h. Boresight .50 cal machinegun
- i. Boresight searchlight
- j. Check all communications equipment
- k. Check all firing switches
- l. Take gun out of travel lock and place turret in operation

5. Fire-mission profile for a hard-point target in the attack.

(a) Situation. The M60A1 Tank is moving across country at 10 MPH when the Tank Commander observes an enemy main battle tank moving across its front from left to right at 1500 meters. The weather is clear and visibility is 3000 meters.

CREW ACTIONS

Target Acquisition Point		End of Engagement Point		
IN POSITION	TANK MOVING ACROSS COUNTRY	INITIAL FIRE COMMAND	SUBSEQUENT FIRE COMMAND	SUBSEQUENT ACTIONS
Tank Commander	Searches for targets.	Ranges on target and issues initial fire command.	Senses round. Announces range/deflection and order to fire. Announces target, cease fire.	Orders driver to move out in prescribed directions. Searches for new target.
Gunner	Searches for targets.	Identifies the target. Lays main gun for range and deflection, taking proper lead. Announces "ON-THE-WAY" and fires.	Makes correction for range/deflection. Announces "ON-THE-WAY" and fires.	Checks fire control system, and searches for new target.
Loader	Searches for targets.	Identifies APDS ammunition. Loads weapon. Announces "UP."	Reloads main gun and announces "UP."	Disposes of expended cartridge. Searches for new target.
Driver	Drives tank, searches for target.	Seeks defilade firing position, and halts tank. Observes fire.	Observes fire.	Moves out in prescribed direction, seeking covered route.

(b) Situation. The M60A1 Tank is stationary in a hull defilade position as part of a defensive position. During the hours of darkness the Tank commander is informed by his platoon leader that enemy troops are advancing on his position at a range of 1000 meters. A range card has been prepared covering the target area, and the platoon leader has designated another tank to provide illumination.

CREW ACTIONS

CREW POSITION	Target Acquisition Point	End of Engagement Point		
	ENEMY TROOPS ADVANCING	INITIAL FIRE COMMAND	SUBSEQUENT FIRE COMMAND	SUBSEQUENT ACTIONS
Tank Commander	Turns on infra-red light, searches and locates target.	Issues initial fire command.	Senses round. Announces range/deflection correction and order to fire. Announces target, cease fire.	Searches area with infra-red to determine coverage of area and if additional targets should be engaged. Reports situation.
Gunner	Examines range card, lays gun on reference point.	Identifies target, and lays main gun for range and deflection. Announces "ON-THE-WAY" and fires.	Makes correction for range/deflection. Announces "ON-THE-WAY" and fires.	Relays gun on reference point and further studies range card for possible additional targets.
Loader		Selects proper ammunition (BEEHIVE). Makes prescribed fuze setting. Loads round of ammunition.	Prepares and loads additional round, if required. Assists gunner in the event of stoppage of coaxial machinegun.	Checks ammunition and weapons in the event of subsequent target engagement.
Driver	Dis mounts to the flank and front of tank providing local security.	Selects proper ammunition (BEEHIVE). Makes prescribed fuze setting. Loads round of ammunition.	Prepares and loads additional round, if required. Assists gunner in the event of stoppage of coaxial machinegun.	Checks ammunition and weapons in the event of subsequent target engagement.

(c) Situation. The M60A1 Tank is moving across country in the attack at 10 MPH when the tank commander observes an enemy convoy of three trucks moving across his front from left to right at an estimated range of 1000 meters. The weather is clear and visibility is 2500 meters.

CREW ACTIONS

CREW POSITION	Target Acquisition Point		End of Engagement Point	
	ENEMY CONVOY MOVING ACROSS THE FRONT	INITIAL FIRE COMMAND	SUBSEQUENT FIRE COMMAND	SUBSEQUENT ACTIONS
Tank Commander	Searches for targets.	Issues initial fire command. Engages enemy trucks from right to left with cal .50 machinegun.	Senses rounds for coaxial machinegun. Announces range/deflection corrections. Makes necessary adjustment of cal .50 machinegun firing.	Searches area through periscope to insure complete coverage.
Gunner	Searches for targets.	Identifies the target. Lays coaxial machinegun, taking necessary lead and engaging target area from right to left.	Makes necessary correction in range/deflection.	Searches area through periscope to insure complete coverage.
Loader	Searches for targets.	Assists the gunner in the event of any stoppages of the coaxial machinegun.	Continues to assist the gunner with any immediate action required for the coaxial machinegun.	Disposes of expended cartridges. Searches for new target.
Driver	Drives tank, searches for targets.	Keeps tank at even speed on as smooth a course as possible.	Warns crew of any impending change in speed or direction.	Continues in prescribed direction, seeking best route.

Mission Profiles
(Commander, Gunner, Driver, and Loader)

M60A1 Tank
(Laying and Firing the Tank Main Gun)

Phase	Task	Performed By				Initial Turret Control		Target Motion		Visibility	
		Task Commander	Gunner	Leader	Driver	Task Commander	Gunner	Moving	Stationary	Un-restricted	Restricted
Laying	1. Alert crew to presence of target	x				x	x	x	x	x	x
	2. Insure turret power switch in ON position		x			x	x	x	x	x	x
	3. Insure turret free of obstructions which would prevent traverse			x		x	x	x	x	x	x
	4. Designate type of ammunition	x				x	x	x	x	x	x
	5. Specify illumination	x				x	x	x	x		x
	6. Describe target	x				x	x	x	x	x	x
	7. Announce estimated speed of target	x				x	x	x		x	x
	8. Direct driver to stop tank	x				x	x	x	x	x	x
	9. Stop tank				x	x	x	x	x	x	x
	10. Lay gun for direction	x				x		x	x	x	x
	11. Announce direction	x					x	x	x	x	x
	12. Lay gun for direction		x				x	x	x	x	x
	13. Acknowledge recognition of target		x			x	x	x	x	x	x

Phase	Task	Performed By				Initial Turret Control		Target Motion		Visibility	
		Task Commander	Gunner	Leader	Driver	Tank Commander	Gunner	Moving	Stationary	Unrestricted	Restricted
Laying (cont'd.)	14. Release control of turret to gunner	x				x		x	x	x	x
	15. Index ammunition into computer		x			x	x	x	x	x	x
	16. Select firing switch		x			x	x	x	x	x	x
	17. Select round to be loaded			x		x	x	x	x	x	x
	18. Set fuze on round, if required			x		x	x	x	x	x	x
	19. Load round			x		x	x	x	x	x	x
	20. Lay on target		x			x	x	x	x	x	x
Firing	21. Apply initial lead		x			x	x	x		x	x
	1. Issue command to fire	x				x	x	x	x	x	x
	2. Announce ON THE WAY		x			x	x	x	x	x	x
	3. Fire main gun		x			x	x	x	x	x	x

APPENDIX B

SAMPLE TASK INVENTORY QUESTIONNAIRE:

155MM HOWITZER (SP)
POSITION: GUNNER

JOB TASK INVENTORY QUESTIONNAIRE

TASK INVENTORY

Instructions: Read the following directions.

The Army needs accurate information about the work you do. The Job Task Inventory Questionnaire is the means by which you supply this information. It is NOT a test, and the results will not be used to evaluate you, your supervisor, nor your unit. In filling out the questionnaire, you are responsible for giving accurate information about the work you do.

General Directions for This Section

Before filling out this Questionnaire, there are a few points we need to make clear.

(1) You are going to be asked to describe your present job in terms of job tasks. You do not report tasks performed by other persons working with you unless you also do the tasks as part of your regular job. If you take over additional tasks for a few days while someone is away, you do not report this work.

(2) Work that is not part of your present job will be left out, no matter how often you did it in the past.

(3) We are interested in only a small part of your job as a crew member. We want you to think about all the tasks or activities involved in preparing the weapon for firing and engaging an enemy target. Tasks concerned with maintenance, communication, tactics, supply, and other support functions should not be included on the lists.

(4) In describing your present job, go back as far in time as necessary to get a true picture. You will probably need to go back not less than one month nor more than a year.

(5) Use the last page for write-in space. Write in any tasks you perform that were not on the list.

Directions for Rating Scales

Read each TASK and, as you read, decide if your job (all of your duties) normally requires you to perform that particular TASK. If it does not, draw a line through the task, write 0 (zero) in Column A and go on to the next TASK. If it does, fill in Column A using the rating scales below.

Use Rating Scale A for column A to select the numeral between 1 and 5 that best describes the extent to which the TASK is a significant part of your job (in terms of time and/or importance).

RATING SCALE A

- | | |
|--|----|
| 1 - INSIGNIFICANT part of my job/duties | -1 |
| 2 - NOMINALLY SIGNIFICANT part | -2 |
| 3 - MODERATELY SIGNIFICANT part of my job/duties | -3 |
| 4 - SIGNIFICANT part | -4 |
| 5 - HIGHLY SIGNIFICANT part of my job/duties | -5 |

It is important to the objective of this study that you respond only to TASKS that are a part of your job and that you respond to all of the TASKS that are a part of your job.

Read each TASK carefully.

- (1) Decide whether or not you do it.
- (2) Rate its significance as a part of your job/duties.
- (3) If you do not understand the meaning of a TASK, that TASK is probably NOT a part of your job and you should not respond to it.

Background Information

1. Name _____
2. Rank/Grade _____
3. Primary MOS _____
4. Duty MOS _____
5. What is your current crew position for the M109, 155mm SP
howitzer/ _____? (Check One)

_____ Chief of Section

_____ Gunner

_____ Assistant Gunner

_____ No. 1 Cannoneer

_____ No. 2 Cannoneer

_____ No. 3 Cannoneer

_____ No. 4 Cannoneer

_____ No. 5 Cannoneer

_____ No. 6 Cannoneer

_____ Driver

- a. How long have you been in that position? _____
- b. How much time have you spent in combat in that position
(if any)? _____

6. What other M109, 155mm SP howitzer/ _____
crew position have you held? (Check One)

_____ Chief of Section

_____ Gunner

_____ Assistant Gunner

_____ No. 1 Cannoneer

_____ No. 2 Cannoneer

_____ No. 3 Cannoneer

_____ No. 4 Cannoneer

_____ No. 5 Cannoneer

_____ No. 6 Cannoneer

_____ Driver

a. How long were you in that position? _____

b. How much time did you spend in combat in that position (if any)? _____

7. What crew positions have you had with other cannons? (List all positions including the weapon system.)

Weapon System	Position Title	Length of Time in Position	Length of Time in Position in Combat (If Any)

GUNNER

Rating Scale - Column A

- 1 - INSIGNIFICANT part of my job/duties
- 2 - NOMINALLY SIGNIFICANT part
- 3 - MODERATELY SIGNIFICANT part of my job/duties
- 4 - SIGNIFICANT part
- 5 - HIGHLY SIGNIFICANT part of my job/duties

PREPARE FOR ACTION:	A
1. Release cab traverse lock	
2. Place cab power switch to On	
3. Select No. 1 gunner for power elevation	
4. Check equilibrator fluid level	
5. Check cab hydraulic system power pack pressure	
6. Assist driver in disengaging traveling lock	
7. Check functioning of traversing mechanism	
8. Command driver to lift and lock ballistic cover	
9. Install panoramic telescope	
10. Uncover azimuth 6400-mil counter and zero gunner's aid counter	
11. Set azimuth counter to 3200 mils	
12. Level telescope mount	
13. Test and align (boresight) fire control equipment	
14. Lay howitzer for direction	
15. Identify aiming point through telescope	
16. Set announced deflection on azimuth counter	
17. Traverse cab until reticle pattern of telescope is centered on objective lens of aiming circle	
18. Checks that pitch- and cross-level bubbles are centered	
19. Direct alignment of aiming posts and/or collimator	

GUNNER (continued)

Rating Scale - Column A

- 1 - INSIGNIFICANT part of my job/duties
- 2 - NOMINALLY SIGNIFICANT part
- 3 - MODERATELY SIGNIFICANT part of my job/duties
- 4 - SIGNIFICANT part
- 5 - HIGHLY SIGNIFICANT part of my job/duties

PREPARE FOR ACTION (cont'd):	A
20. Lay on alternate aiming point	
INDIRECT FIRE:	
21. Set and lay for deflection	
22. Set announced deflection on reset counter	
23. Traverse piece until vertical reticle of telescope is on left edge of aiming point or proper sight picture in collimator	
24. Center pitch- and cross-level bubbles	
25. Correct for displacement when vertical reticle is displaced	
26. Place gunner's elevating control switch to Gunner*	
27. Place announced quadrant on the elevation counter*	
28. Elevate tube until elevation-level bubble is centered*	
29. Refer piece	
DIRECT FIRE:	
30. Prepare panoramic telescope for direct laying	
31. Actuate click sight mechanism	
32. Set initial lead on azimuth counter	
33. Traverse howitzer until vertical reticle is centered on target	
34. Maintain sight picture by continuous tracking of target	
35. Give command "Fire"	

*When the one-man, one-sight system is used

GUNNER (continued)

Rating Scale - Column A

- 1 - INSIGNIFICANT part of my job/duties
- 2 - NOMINALLY SIGNIFICANT part
- 3 - MODERATELY SIGNIFICANT part of my job/duties
- 4 - SIGNIFICANT part
- 5 - HIGHLY SIGNIFICANT part of my job/duties

DIRECT FIRE (cont'd):	A
36. Turn azimuth knob in 5-mil increments to set lead changes as directed	
37. Lay for deflection	
38. Announce range and set elevation quadrant*	
39. Elevate howitzer until bubble in pitch-level vial is centered*	
40. Center cross-level bubble on the panoramic telescope mount*	

* When one-man, one-sight system is used

Please write in additional tasks in the spaces below

Rating Scale - Column A

- 1 - INSIGNIFICANT part of my job/duties
- 2 - NOMINALLY SIGNIFICANT part
- 3 - MODERATELY SIGNIFICANT part of my job/duties
- 4 - SIGNIFICANT part
- 5 - HIGHLY SIGNIFICANT part of my job/duties

[illegible]

APPENDIX C

DESCRIPTIVE STATISTICS FOR PERSONNEL

Table C-1

NUMBER PARTICIPATING, BY RANK, IN EACH WEAPON SYSTEM

Rank	81MM	155MM	M60A1
E1	4	8	2
E2	27	36	18
E3	55	42	29
E4	32	27	36
E5	24	21	13
E6	3	15	23
E7	0	0	27
E8	0	0	1
2LT	0	0	2
TOTAL	145	149	151

Table C-2

NUMBER PARTICIPATING, BY MONTHS OF DUTY, IN EACH WEAPON SYSTEM

Time (Months)	81MM	155MM	M60A1
1	26	10	4
2	9	10	15
3	16	18	10
4	8	11	3
5	11	5	0
6	15	17	8
7	6	6	2
8	6	7	2
9	8	2	1
10	7	7	7
11	1	4	4
12	9	10	14
13	1	3	3
14	3	0	3
15	2	1	4
16	1	0	4
17	0	0	4
18	2	2	6
19	0	0	4
20	0	1	3
21	1	2	1
22	0	0	2
23	1	0	1
24	5	5	4
25	0	0	1
26	1	0	0
30	2	1	0
32	1	0	1
33	0	0	1
36	0	3	3
39	0	0	1

Table C-2 (continued)

Time (Months)	81MM	155MM	M60A1
42	1	0	0
45	0	0	1
48	1	1	4
50	0	0	1
54	1	0	0
60	1	1	9
62	0	0	1
72	0	1	0
84	0	1	0
96	0	2	1
108	0	1	1
114	0	0	1
156	0	1	0
168	0	0	3
180	0	0	2
192	0	0	3
204	0	0	1
216	0	0	1
240	0	0	2
TOTAL	146	133	147

Table C-3

NUMBER PARTICIPATING, BY MONTHS OF COMBAT, IN EACH WEAPON SYSTEM

Time (Months)	81MM	155MM	M60A1
0	137	129	121
1	0	0	2
2	0	1	0
3	0	1	0
4	0	2	1
6	2	2	1
8	1	1	2
9	1	0	0
10	0	0	1
11	0	0	3
12	2	5	15
13	0	1	1
14	1	0	0
18	1	2	0
20	0	0	1
22	0	0	1
24	0	4	1
25	0	4	1
36	1	0	0
38	0	1	0
TOTAL	146	153	151

APPENDIX D

RANKED TASK INVENTORIES FOR THE
M60A1 TANK
155 MM HOWITZER (SP)
81MM MORTAR

INCLUDING AN IDENTIFICATION(*) OF
TASKS COMMON TO THE TOP ONE-THIRD
OF EACH LIST

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WFAPON CODE = 8 POSITION = 1 TASKS = 4 MEMBERS = 44

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TASK	TASK TITLE	COUNT OF TASKS LISTED				PERCENT OF MEMBERS PERFORMING	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	ORDERED BY
		AVERAGE PERCENT PART OF JOB BY ALL MEMBERS		PERCENT OF MEMBERS PERFORMING					
		%	***	%	%				
		%	%	%	%				
12	ANALYZE A TARGET RAPIDLY AND SELECT BEST AVAILABLE AMMUNITION	100.00	2.05	2.95	2.95	5			
9	ANNOUNCE AN INITIAL FIRE COMMAND.	100.00	2.92	2.92	5.86				
11	LAY THE MAIN GUN FOR DIRECTION.	100.00	2.86	2.86	8.72				
3	LOAD AND CHARGE THE CUPOLA MACHINEGUN (50 CAL.).	100.00	2.80	2.80	11.52				
47	SELECT FIRING POSITIONS.	100.00	2.79	2.79	14.31				
33	DISTINGUISH BETWEEN FRIENDLY AND ENEMY PERSONNEL AND MATERIAL	100.00	2.79	2.79	17.09				
4	PREPARE TO FIRE THE CUPOLA MACHINEGUN.	100.00	2.79	2.79	19.88				
5	FIRE THE CUPOLA MACHINEGUN.	100.00	2.78	2.78	22.66				
18	RANGE ON A TARGET, UTILIZING THE RANGE FINDER.	100.00	2.78	2.78	25.44				
8	RESPOND TO A CUPOLA MACHINEGUN MISFIRE.	100.00	2.74	2.74	28.19				
45	BORESIGHT AND ZERO THE 50 CAL MACHINEGUN.	100.00	2.74	2.74	30.93	10			
15	RELEASE CONTROL OF TURRET TO GUNNER UPON HEARING IDENTIFIED.	100.00	2.73	2.73	33.66				
17	PLACE THE RANGE FINDER IN OPERATION.	97.69	2.76	2.70	36.36				
13	DESIGNATE SPECIFIC TARGET WHEN MORE THAN ONE IS OBSERVED.	97.69	2.75	2.69	39.04				
6	UNLOAD THE CUPOLA MACHINEGUN.	100.00	2.68	2.68	41.72	15			
10	TURN ON THE XEON SEARCHLIGHT.	100.00	2.67	2.67	44.39				
48	OPERATE TANK COMMANDER'S INFERRED CONTROLS AND EQUIPMENT.	97.69	2.72	2.66	47.05				
7	UNLOAD A RUPTURED CARTRIDGE CASE FROM THE CUPOLA MACHINEGUN.	97.69	2.62	2.56	49.61				
23	INSPECT FOR SAFETY OF CREW BEFORE TRAVERSING TURRET.	100.00	2.52	2.52	52.13				
20	ANNOUNCE RANGE WHEN RANGE FINDER CANNOT MECHANICALLY TRANSFER	100.00	2.50	2.50	54.63	20			
22	IDENTIFY TARGET PROVIDED BY THE PLATOON LEADER.	100.00	2.46	2.46	57.09				
14	PROVIDE GUIDANCE TO THE GUNNER FOR LAYING THE MAIN GUN FOR	97.69	2.48	2.42	59.51				
21	IDENTIFY TARGET PROVIDED BY ANOTHER CREW MEMBER.	97.69	2.42	2.37	61.98				
1	PLACE THE TURRET CUPOLA INTO POWER OPERATING.	90.48	2.57	2.33	64.21				
46	BORESIGHT AND ZERO THE MAIN GUN.	93.13	2.48	2.31	66.52	25			
2	DEACTIVATE THE TURRET CUPOLA FROM POWER OPERATION.	84.63	2.47	2.19	68.72				
38	ENGAGE TARGETS, UTILIZING ARTIFICIAL ILLUMINATION.	95.44	2.26	2.16	70.38				
37	TROUBLESHOOT MALFUNCTIONS OF THE MAIN GUN.	93.13	2.31	2.15	73.03				
16	MEASURE DEFLECTION SHOT IN MILS, UTILIZING A REFERENCE GUN	95.44	2.10	2.09	75.12				
41	OPERATE HEADSET AND CHEST SET.	92.13	2.24	2.03	77.21	30			

COAXIAL TANK JOB ANALYSIS TANK COMMANDER

TASK	TASK TITLE	Z	Z	%	Z	N
42	PREPARE A RANGE CARD.	95.44	2.12	2.03	79.23	
26	INDEX APPROPRIATE RANGE, IF REQUIRED.	84.16	2.37	1.69	81.23	
43	FIRE FROM A RANGE CARD.	93.12	2.36	1.92	83.15	
42	ESTIMATE SPEED OF MOVING TARGETS.	90.88	2.02	1.84	84.97	
27	APPLY MIL RELATION FORMULA.	84.06	1.76	1.65	86.64	35
31	PERFORM THE NON-SENSING METHOD OF ADJUSTMENT.	84.06	1.70	1.60	88.74	
44	BORISIGHT AND ZERO THE COAXIAL MACHINEGUN.	81.81	1.71	1.40	89.84	
39	CHECK AZIMUTH INDICATOR FOR ACCURACY AND SIGHTING.	79.09	1.69	1.33	90.24	
30	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT AGAINST A MOV	82.13	1.68	1.14	91.93	
35	FIRE COAXIAL MACHINEGUN.	77.25	1.40	1.08	93.06	
36	FIRE COAXIAL MACHINEGUN AT A MOVING TARGET.	77.25	1.36	1.05	94.11	40
40	READ THE COMPUTER.	75.79	1.42	1.11	95.15	
34	PREPARE TO FIRE COAXIAL MACHINEGUN.	69.84	1.36	0.80	96.04	
28	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING A	56.05	1.40	0.88	96.92	
19	PURGE MAIN GUN HYDRAULIC SYSTEM.	55.88	1.28	0.84	97.77	45
25	INDEX APPROPRIATE AMMUNITION.	61.41	1.24	0.75	98.52	
29	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING A	54.50	1.48	0.75	99.28	
24	TURN ON APPROPRIATE GUN SWITCH.	59.36	1.22	0.72	100.00	48

WEAPON CODE = 8 POSITION = 2 TASKS = 37 MEMBERS = 43

GUINNESS

MFMBFS = 43

TASKE = 37

POSITION = 2

WFAPDN CODE = 8

ORDERED BY.....	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	COUNT OF TASKS LISTED.....
AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....
AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....
PERCENT OF MEMBERS PERFORMING.....

TASK TITLE

TASK

333 BORESIGHT AND ZERO THE MAIN GUN.
336 EMPLOY INFRARED SIGHTS.

I COMPLY WITH THE ELEMENTS OF A FIRE COMMAND.

37 ENGAGE TARGETS, USING ARTIFICIAL ILLUMINATION.

334 FORSIGHT AND ZERO THE COXIAL MACHINEGUN.

32 FIRE FROM A RANGE CAR.

7 IDENTIFY THE TARGET.

31 PREPARE A RANGE CARD.

ALL TRAVERSE RAPIDLY IN THE ANNUOUS

14 ANNOUNC ON-THE-WAY AND FIRE.

35 BORE SIGHT THE SPARC LIGHT.

222 APPLY "FIRST-TW-TARGET" METHOD OF ADJUSTMENT AGAINST A MOVING

IS IF UTILIZING TELESCOPIC SIGHT, SILENCER

3 PLACE THE TURRET IN POWER ON

5 INDEX ANNOUNCED ADMINISTRATION.

4 TURN ON APPROPRIATE C.J.W. SWITCH.

9 UPON RECEIPT OF RANGE ELEMENT OF THE CLIP (COMMVA.), MAKE A PR

17. APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT

16 APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT

TO APPLY THE INITIAL LEAD FOR A MOVING TARGET.

226 DISTINGUISH BETWEEN FRIENDLY AND ENEMY DEFS.

23 APPLY TANK COMMANDER'S CORRECTION FOR SUPPLY

19 APPLY TANK COMMANDMENTS, CORRECTIONS FOR

APPLY TANK COMMANDER'S SUPPORT

20 APPLY NON-SENSING. METHOD OF ADJUSTMENT. WHE

12 LOCATE DIRECTION OF TARGET BY REFLECTIVE POINT

EXPANSION OF THE PERISCOPE BY FACILITIES

ASSURE TURKEY TRAVELLING; AREA IS CLEAR

224 FIRE (AXIAL MACHINEGUN, USIN, INFINITY SIG.

25 SEARCH FOR TARGETS THROUGH THE VIEWPORT; MIN-

[illegible]

100

DRAGON M60A1 TANK JOB ANALYSIS GUNNER

TASK	TASK TITLE	%	%	%	%	N
6	LOOK THROUGH VISION BLOCK TO LOCATE THE TARGET.	95.31	2.59	****	87.26	
29	ASSIST TANK COMMANDER IN LOCATING THE DIFFICULTY WHEN THE GUN	95.31	2.53	2.47	84.68	
27	UPON DETECTION OF ENEMY TARGET, PROVIDE TANK COMMANDER WITH	93.30	2.44	2.41	91.95	
30	ASSIST LOADER IN LOCATING THE DIFFICULTY WHEN THE GUN FAILS	95.31	2.16	2.06	94.00	
28	ASSIST THE LOADER IF THE MAIN GUN FAILS TO LOAD.	97.63	2.07	2.02	96.02	35
13	INDEX THE RANGE, IF REQUIRED.	90.69	2.22	2.01	98.04	
21	ESTIMATE SPEED OF MOVING TARGET.	95.31	2.06	1.96	100.00	37

- * 1 IDENTIFY ALL TYPES OF TANK AMMUNITION.
- 6 INSURE PATH OF MAIN GUN RECOIL IS CLEAR.
- 29 READ REPLINISHER TAPE.
- 14 TAKE IMMEDIATE ACTION IN CASE OF A STOPPAGE OF THE MACHINEGUN.
- 5 ANNOUNCE UP WHEN THE WEAPON IS LOADED AND READY TO BE FIRED.
- 3 LOAD AMMUNITION ANNOUNCED BY THE TANK COMMANDER.
- 4 INSURE SAFETY SWITCHES ARE ON OR OFF AS REQUIRED.
- 17 STOP MAIN GUN AMMUNITION.
- 15 TAKE IMMEDIATE ACTION IN CASE OF A RUNAWAY COAXIAL MACHINEGUN.
- 7 CONTINUE TO LOAD UNTIL THE TANK COMMANDER ANNOUNCES CEASE FI
- 11 INSTALL COAXIAL MACHINEGUN.
- 16 UNLOAD THE COAXIAL MACHINEGUN AMMUNITION.
- 18 STOP COAXIAL MACHINEGUN AMMUNITION.
- 13 LOAD COAXIAL MACHINEGUN.
- 10 DISASSEMBLE, MAINTAIN AND ASSEMBLE COAXIAL MACHINEGUN.
- 21 UNLOAD A ROUND BY USE OF RAMMING AND EXTRACTING TOOL.
- 20 UNLOAD A ROUND OR CARTRIDGE CASE THAT DOES NOT AUTOMATICALLY
- 19 UNLOAD A MAIN GUN ROUND FOR WHICH NO ATTEMPT HAS BEEN MADE Y
- 23 DISPOSE OF EMPTY CARTRIDGE CASES.
- 9 REMOVE COAXIAL MACHINEGUN.
- 2 AID TANK COMMANDER IN ACQUIRING TARGETS.
- 8 SET AMMUNITION FUZZES, IF REQUIRED.
- 12 BORESIGHT COAXIAL MACHINEGUN.
- 26 UNLOCK, MAINTAIN AND LOCK GUN TRAVEL LOCK.
- 25 CHECK MOMENT TRAYS, BRACKETS, GUN TOOL ROLL AND TURRET RUST
- 27 MAINTAIN, INSTALL AND OPERATE HEADSET AND CHEST SET.
- 30 CHECK OPERATION OF THE INTERPHONE CONTROL BOX AND INTERPHONE
- 22 UNLOAD A STUCK PROJECTILE WHEN SEPARATED FROM THE CARTRIDGE
- 24 CHECK TURRET FLOWER.
- 28 REMOVE, INSTALL LOADER'S PERISCOPE.

DRAGON '6001 TANK JOB ANALYSIS
LOADER

TASK	TASK TITLE	Z	%	Z	%	N
32	CHECK AND MAINTAIN OPERATION OF THE EXTERNAL INTERPHONE.	83.69	2.19	****	96.38	
33	INSTALL, REMOVE AND OPERATE ALL RADIO COMPONENTS.	83.31	2.06	1.84	98.20	
31	ENTER PRESCRIBED RADIO NET.	86.00	2.09	1.82	100.00	33

DRAGON M60A1 TANK JOB ANALYSIS DRIVER

WEAPON CODE = 8 POSITION = 4 TASKS = 20 MEMBERS = 18

COUNT OF TASKS LISTED			
ORDERED BY	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING
TASK	TASK TITLE	%	%

10	DRIVE AT NIGHT.	100.00	5.95	5.85	5.85
16	STOP THE TANK ON TANK COMMANDER'S ORDER, BRINGING THE VEHICLE	100.00	5.78	5.78	11.63
3	CHECK TRANSMISSION OIL.	100.00	5.78	5.78	17.41
4	CHECK MAIN ENGINE OIL.	100.00	5.78	5.78	23.18
2	FILL FUEL TANKS.	100.00	5.71	5.71	28.90
1	DRIVE AND MANUEVER UNDER ALL WEATHER CONDITIONS AND OVER ALL	100.00	5.71	5.71	34.60
11	DRIVE WITH DRIVER'S HATCH CLOSED.	100.00	5.54	5.54	40.14
12	DRIVE TANK IN TACTICAL FORMATIONS.	100.00	5.25	5.25	45.39
6	REMOVE, INSPECT AND INSTALL DRIVER'S PERISCOPES.	100.00	5.19	5.19	50.58
17	DRIVE THE VEHICLE FORWARD SMOOTHLY WHEN MACHINEGUNS ARE USED	88.88	5.75	5.11	55.60
9	FORD WATER - 3 STACLE OF FORDING DEPTH.	100.00	4.95	4.95	60.64
13	TOW A DISABLED TANK.	100.00	4.83	4.83	65.47
20	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING ROUGHNESS I	100.00	5.10	4.82	70.29
14	EFFE A BELLED OR MIRE TANK.	94.44	4.77	4.77	75.05
15	SEARCH FOR GOOD FIRING POSITIONS THAT AFFORD PROTECTION FOR	94.44	4.70	4.44	79.49
19	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING, ABRUPT CHA	100.00	4.43	4.43	83.92
7	CLEAN, INSTALL AND REMOVE INCREASED PERISCOPES.	100.00	4.37	4.37	88.30
8	INSTALL AND OPERATE TANK HELMET COMMUNICATIONS.	94.44	4.50	4.25	92.54
18	AID THE TANK COMMANDER IN ACQUIRING TARGETS.	94.44	4.00	3.78	96.32
5	CHECK ACCIDENT IDENTIFICATION AND OPERATOR'S REPORT OF MOTOR	88.88	4.14	3.68	100.00

DRAGON 155MM SP HOWITZER JOB ANALYSIS
CHIEF OF SECTION

WEAPON CODE = 5 POSITION = 1 TASKS = 33 MEMBERS = 33

TASK	TASK TITLE	COUNT OF TASKS LISTED				AVERAGE PERCENT PART OF JOB BY ALL MEMBERS				AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING				PERCENT OF MEMBERS PERFORMING			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
16	INSURE EFFICIENT AND SAFE OPERATION	100.00	3.55	3.55	3.55	100.00	3.55	3.55	3.55	100.00	3.55	3.55	3.55	100.00	3.55	3.55	3.55
20	CHECK FUNCTIONING OF MATERIAL DURING FIRING	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53
5	CHECK POSITION OF REPLENISHMENT TAP INDICATOR AND RECUPERATOR	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53	100.00	3.53	3.53	3.53
2	SUPERVISE OPERATION DURING ENTIRE SEQUENCE	100.00	3.48	3.48	3.48	100.00	3.48	3.48	3.48	100.00	3.48	3.48	3.48	100.00	3.48	3.48	3.48
6	CHECK RECOIL SYSTEM	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41
13	VERIFY THAT PIECE IS READY FOR ACTION	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41	100.00	3.41	3.41	3.41
28	ESTIMATE RANGE TO TARGET	100.00	3.34	3.34	3.34	100.00	3.34	3.34	3.34	100.00	3.34	3.34	3.34	100.00	3.34	3.34	3.34
21	REPORT ERRORS AND UNUSUAL INCIDENTS TO XO	100.00	3.35	3.35	3.35	100.00	3.35	3.35	3.35	100.00	3.35	3.35	3.35	100.00	3.35	3.35	3.35
14	REPORT ANY DEFECTS THAT WILL CAUSE DELAY TO XO	100.00	3.43	3.43	3.43	100.00	3.43	3.43	3.43	100.00	3.43	3.43	3.43	100.00	3.43	3.43	3.43
17	FOLLOW AND REPEAT FIRE COMMANDS	100.00	3.33	3.33	3.33	100.00	3.33	3.33	3.33	100.00	3.33	3.33	3.33	100.00	3.33	3.33	3.33
18	INDICATE WHEN PIECE IS READY TO FIRE	100.00	3.30	3.30	3.30	100.00	3.30	3.30	3.30	100.00	3.30	3.30	3.30	100.00	3.30	3.30	3.30
29	DETERMINE LEAD IN MILS	100.00	3.28	3.28	3.28	100.00	3.28	3.28	3.28	100.00	3.28	3.28	3.28	100.00	3.28	3.28	3.28
8	FOLLOW FIRE COMMANDS	100.00	3.27	3.27	3.27	100.00	3.27	3.27	3.27	100.00	3.27	3.27	3.27	100.00	3.27	3.27	3.27
31	GIVE SUBSEQUENT COMMANDS FOR CHANGE IN LEAD AND RANGE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26
15	COMMAND FIRE OF PIECE ON COMMAND OF XO	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26
30	GIVE INITIAL COMMANDS IN SEQUENCE	100.00	3.21	3.21	3.21	100.00	3.21	3.21	3.21	100.00	3.21	3.21	3.21	100.00	3.21	3.21	3.21
26	IDENTIFY OR SELECT TARGET	100.00	3.19	3.19	3.19	100.00	3.19	3.19	3.19	100.00	3.19	3.19	3.19	100.00	3.19	3.19	3.19
27	IDENTIFY TARGET DESIGNATED BY XO	100.00	3.15	3.15	3.15	100.00	3.15	3.15	3.15	100.00	3.15	3.15	3.15	100.00	3.15	3.15	3.15
7	DIRECT SERVICING OF PIECE	100.00	2.98	2.98	2.98	100.00	2.98	2.98	2.98	100.00	2.98	2.98	2.98	100.00	2.98	2.98	2.98
25	GIVE COMMAND "CHECK FIRING"	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83
19	GIVE COMMAND TO FIRE	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83	100.00	2.83	2.83	2.83
32	COMMANDS "END OF MISSION"	100.00	2.77	2.77	2.77	100.00	2.77	2.77	2.77	100.00	2.77	2.77	2.77	100.00	2.77	2.77	2.77
9	MEASURE SITE TO CPST	100.00	2.76	2.76	2.76	100.00	2.76	2.76	2.76	100.00	2.76	2.76	2.76	100.00	2.76	2.76	2.76
3	DIRECT RACKING OF CARRIAGE AGAINST SPADERS	100.00	2.75	2.75	2.75	100.00	2.75	2.75	2.75	100.00	2.75	2.75	2.75	100.00	2.75	2.75	2.75
10	INDICATE ALTERNATE AIMING POINT TO GUNNER	100.00	2.78	2.78	2.78	100.00	2.78	2.78	2.78	100.00	2.78	2.78	2.78	100.00	2.78	2.78	2.78
11	SELECT CLEARLY DEFINED POINT AT 1500 METERS OR MORE	100.00	2.69	2.69	2.69	100.00	2.69	2.69	2.69	100.00	2.69	2.69	2.69	100.00	2.69	2.69	2.69
22	LAY FOR QUADRANT WITH GUNNER'S QUADRANT	100.00	2.63	2.63	2.63	100.00	2.63	2.63	2.63	100.00	2.63	2.63	2.63	100.00	2.63	2.63	2.63
1	GIVE COMMAND "PREPARE FOR ACTION"	100.00	2.47	2.47	2.47	100.00	2.47	2.47	2.47	100.00	2.47	2.47	2.47	100.00	2.47	2.47	2.47
33	GIVE FIRE COMMANDS WITH RANGE GIVEN IN FORM OF QUADRANT	100.00	2.45	2.45	2.45	100.00	2.45	2.45	2.45	100.00	2.45	2.45	2.45	100.00	2.45	2.45	2.45
24	CONDUCT PREARRANGED FIRES	100.00	2.57	2.57	2.57	100.00	2.57	2.57	2.57	100.00	2.57	2.57	2.57	100.00	2.57	2.57	2.57

DRAGON 155MM SP HOWITZER JOB ANALYSIS
CHIEF OF SECTION

TASK	TASK TITLE	%	%	%	%	N
4	DIRECT DRIVER TO CUT ENGINE AND SET BRAKES	96.94	2.47	****	95.66	
23	MEASURE QUADRANT ON INITIAL ROUND	87.88	2.51	2.40	97.87	
12	READ AND RECORD DEFLECTIONS FROM AZIMUTH COUNTER (ALTERNATE	84.81	2.51	2.20	100.00	33

DRAGON 155MM SP HOWITZER JOB ANALYSIS GUNNER

WEAPON CODE = 5 POSITION #2 TASKS #00 MEMBERS = 29

ORDERED BY.....		COUNT OF TASKS LISTED.....		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	
AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....		PERCENT OF MEMBERS PERFORMING.....	
TASK	TASK TITLE	100.00	2.99	2.99	2.99
9	INSTALL PANORAMIC TELESCOPE	100.00	2.99	2.99	2.99
24	CENTER PITCH- AND CROSS-LEVEL BUBBLES	100.00	2.99	2.99	2.99
25	CORRECT FOR DISPLACEMENT WHEN VERTICAL RETICLE IS DISPLACED	100.00	2.97	2.97	2.97
*18	CHECKS THAT PITCH- AND CROSS-LEVEL BUBBLES ARE CENTERED	100.00	2.97	2.97	2.97
15	IDENTIFY AIMING POINT THROUGH TELESCOPE	100.00	2.95	2.95	2.95
*21	SET AND LAY FOR DEFLECTION	96.50	2.99	2.88	17.76
14	LAY HOWITZER FOR DIRECTION	96.50	2.97	2.87	20.63
17	TRAVERSE CAR UNTIL RETICLE PATTERN OF TELESCOPE IS CENTERED	96.50	2.97	2.87	23.50
16	SET ANNOUNCED DEFLECTION ON AZIMUTH COUNTER	100.00	2.86	2.86	26.36
30	PREPARE PANORAMIC TELESCOPE FOR DIRECT LAYING	100.00	2.86	2.86	29.22
19	DIRECT ALIGNMENT OF AIMING POSTS AND/OR COLLIMATOR	96.50	2.95	2.85	32.07
12	LEVEL TELESCOPE MOUNT	96.50	2.94	2.84	34.91
34	MAINTAIN SIGHT PICTURE BY CONTINUOUS TRACKING OF TARGET	100.00	2.83	2.83	37.74
33	TRAVERSE HOWITZER UNTIL VERTICAL RETICLE IS CENTERED ON TARGET	100.00	2.83	2.83	40.57
20	LAY ON ALTERNATE AIMING POINT	96.50	2.92	2.82	43.39
22	SET ANNOUNCED DEFLECTION ON RESET COUNTER	96.50	2.92	2.82	46.21
11	SET AZIMUTH COUNTER TO 3200 MILS	96.50	2.88	2.78	48.99
13	TEST AND ALIGN CROSSHAIR FIRE CONTROL EQUIPMENT	96.50	2.83	2.73	51.72
23	TRAVERSE PIECE UNTIL VERTICAL RETICLE OF TELESCOPE IS ON LEFT	96.50	2.78	2.68	54.40
36	TURN AZIMUTH KNOB IN 5-MIL INCREMENTS TO SET LEAD CHANGES AS	96.50	2.73	2.63	57.04
7	CHECK FUNCTIONING OF TRAVERSING MECHANISM	100.00	2.63	2.63	59.67
29	REFER PIECE	99.63	2.90	2.60	62.27
10	UNCOVER AZIMUTH 6400-MIL COUNTER AND ZERO GUNNER'S AIM COUNTER	96.50	2.68	2.58	64.84
32	SET INITIAL LEAD ON AZIMUTH COUNTER	96.50	2.65	2.55	67.40
40	CENTER CROSS-LEVEL BUBBLE ON THE PANORAMIC TELESCOPE MOUNT*	96.19	2.64	2.45	69.85
28	ELEVATE TUBE UNTIL ELEVATION-LEVEL BUBBLE IS CENTERED*	99.63	2.68	2.40	72.24
4	CHECK EIGHT-TRATOR FLUID LEVEL	93.06	2.51	2.34	74.58
2	PLACE CAB POWER SWITCH TO ON	99.63	2.59	2.32	76.90
26	PLACE GUNNER'S ELEVATING CONTROL SWITCH TO GUNNER*	93.06	2.49	2.32	79.22
3	SELECT NO. 1 GUNNER FOR POWER ELEVATION	93.06	2.43	2.24	81.48

WEAPON CODE	POSITION	TASKS	MEMBERS
23	27	23	
COUNT OF TASKS LISTED.....			
CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....			
AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....			
AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....			
PERCENT OF MEMBERS PERFORMING.....			
TASK TITLE			
17	100.00	5.00	5.00
21	100.00	5.06	10.15
16	100.00	5.03	15.19
1A	100.00	5.02	20.21
12	100.00	4.92	25.13
27	100.00	4.89	30.03
27	100.00	4.76	34.79
4	95.63	4.94	39.53
14	95.63	4.71	44.24
24	100.00	4.64	48.88
15	91.25	5.05	53.50
13	100.00	4.44	57.94
3	91.25	4.42	61.99
2	86.94	4.64	66.02
1	91.25	4.17	69.83
24	78.25	4.23	73.10
22	86.94	3.67	76.34
25	82.54	3.74	79.42
10	78.25	3.74	82.34
23	82.56	3.41	85.20
5	65.10	3.65	87.54
6	65.10	3.54	89.90
8	73.68	3.00	92.12
10	56.50	3.84	94.29
9	40.81	3.25	96.26
11	40.81	3.14	98.20
20	47.81	3.77	100.00

WEAPON CODE = 5 POSITION 24 TASKS = 18 MEMBERS = 24

ORDERED BY.....	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....
CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....		
COUNT OF TASKS LISTED.....		

TASK	TASK TITLE	PERCENT OF MEMBERS PERFORMING.....				TASK
		%	%	%	%	
9	PLACE PROJECTILE IN LOADING TRAY OF POWER RAMMER	95.81	7.45	7.14	7.14	
6	PROCURE PRIMERS AND PLACE IN CONVENIENT LOCATION	95.81	7.29	6.99	14.13	
14	INSERT PRIMER IN PRIMER CHAMBER, CLOSE BLOCK ASSEMBLY, AND P	95.81	7.08	6.78	20.91	
4	INSPECT, OPERATE, AND CLEAN BREECCH BLOCK, RAMMER, CHAMBER, A	95.81	6.85	6.56	27.48	
16	FIRE HOWITZER ON COMMAND	95.81	6.81	6.53	34.00	5
3	OPERATE FIRING MECHANISM	95.81	6.45	6.18	40.18	
12	PLACE PROPELLANT CHARGE IN CHAMBER	91.63	6.66	6.11	46.29	
15	ATTACH FIRING LANYARD TO FIRING MECHANISM LEVER	95.81	6.37	6.10	52.39	
5	PROCURE SPONGE, RUMPAD, AND BUCKET OF WATER AND PLACE IN CON	100.00	6.06	6.06	58.46	
8	RELEASE RAMMER CYLINDER LATCH	91.63	6.53	5.98	64.44	10
11	RETURN RAMMER TO STOWED POSITION	91.63	6.44	5.90	70.34	
17	SWAB AND INSPECT THE POWDER CHAMBER	95.81	6.04	5.79	76.13	
10	MOVE RAMMER CYLINDER TO RAM POSITION	87.50	6.46	5.65	81.78	
13	COMMAND "CLOSE" AND CLOSE THE BREECCH	91.63	6.06	5.55	87.33	
7	LOWER RAMMER TO OPERATING POSITION	83.31	4.98	4.15	91.48	15
1	OPEN REAR TURRET DOORS	75.00	3.90	2.93	94.48	
2	REMOVE LEFT SPARE STRUT SAFETY PIN, RELEASE LOCKING LATCH, A	58.31	4.91	2.84	97.27	
18	CALL OUT NUMBER AND GUARANT FOR EACH ROUND IN VOLLEY FIRE	42.50	4.37	2.73	100.00	18

WEAPON CODE = 5 POSITION 25 TASKS = 54 MEMBERS = 40

ORDERED BY.....	CUMULATIVE AVERAGE PERCENT PART OF JOE BY ALL MEMBERS.....	COUNT OF TASKS LISTED.....
.....	AVERAGE PERCENT PART OF JOE BY ALL MEMBERS.....	.....
.....	AVERAGE PERCENT PART OF JOE BY MEMBERS PERFORMING.....	.....
.....	PERCENT OF MEMBERS PERFORMING.....	.....

TASK	TASK TITLE	%	%	N
10	UNLOAD AND ARRANGE PROJECTILES	92.50	3.56	2.94
12	BACK CARRIAGE AGAINST SPACES	67.50	4.23	2.84
6	ASSIST NO. 4 AND 5 IN UNLOADING AND ARRANGING AMMUNITION	82.50	3.08	2.54
17	REMOVE MUZZLE PLUG	77.50	3.23	2.50
23	LOWER AND SECURE HOWITZER TRAVELING LOCK	70.00	3.48	2.43
5	UNLOAD AND ARRANGE EQUIPMENT AS DIRECTED BY THE CHIEF OF SEC	87.50	2.75	2.41
31	INSPECT AND CLEAN PROJECTILES	80.00	2.94	2.35
21	SFT OUT AIMING POSTS	82.50	2.83	2.33
25	UNLOAD AIMING POSTS, RAMMER STAFF SECTIONS AND PIONEER EQUIP	87.50	2.66	2.33
32	CARRY PROJECTILE TO HOWITZER	77.50	2.88	2.23
48	SELECT PROPER PROJECTILE	80.00	2.75	2.20
8	SFT BRAKE AND STOP ENGINE	57.50	3.82	2.20
7	DROP THE RIGHT SPADE	75.00	2.88	2.16
16	UNLOAD FUZE BOXES AND OPEN AND ARRANGE FUZES	87.50	2.48	2.15
34	ASSIST NO. 3 AND 4 IN PREPARING AMMUNITION	82.50	2.59	2.13
11	UNLOAD AND ARRANGE PROPELLANT CHARGES	80.00	2.64	2.11
43	EXAMINE ENTIRE PROJECTILE FOR DEFECTS	80.00	2.62	2.09
35	INSPECT FUZE WELL FOR RUST AND CRIP	82.50	2.52	2.08
9	ASSIST NO. 2 IN UNLOADING FUZE BOXES AND OPERATING AND ARRANGING	82.50	2.51	2.07
42	ATTACH DESIGNATED FUZE	80.00	2.55	2.04
39	REMOVE GROMMET AND EXAMINE ROTATING HEAD FOR CRIP OR BURRS	72.50	2.81	2.04
13	PROCURE FUZE SETTER	70.00	2.80	2.03
27	PLACE INSTRUMENT PANEL INSIDE DRIVER'S COMPARTMENT AND CLOSE	80.00	3.37	2.02
30	ASSIST NO. 5 IN PREPARING THE PROPELLANT CHARGE	80.00	2.47	1.98
28	SECURE DRIVER'S WATCH	57.50	3.43	1.97
18	EMPLACE AND HOLD TESTING TARGET	85.00	2.23	1.90
40	PLACE PROJECTILE NEAR NO. 1	72.50	2.61	1.89
14	ASSEMBLE AIMING POSTS OR COLLIMATOR	80.00	2.28	1.82
49	STAND PROJECTILE ON END AND CLEAN THOROUGHLY	75.00	2.20	1.71
52	HOLD PROJECTILE WHILE NO. 2 FUZES AND SFTS FUZE	75.00	2.27	1.70

DRAGON 155MM SP HOWITZER JOB ANALYSIS
CANNONEERS NOS. 2-6 AND DRIVER

TASK	TASK TITLE	Y	Z	Y	Z	N
46	PREPARE AND VERIFY CORRECT CHARGE	67.50	2.49	***	66.92	
38	SELECT CHARGE DESIGNATED BY XO	45.00	2.58	1.68	48.60	
50	SET TIME FUZES USING APPROPRIATE FUZE SETTER	67.50	2.47	1.67	70.24	
4	ASSIST NO. 3 IN PREPARING PAULIN	77.50	2.15	1.64	71.93	
26	ASSEMBLE BATTERY STAFF AND WEAP	72.50	2.20	1.66	73.59	35
3	REMOVE PAULIN FROM CAR STORAGE RACK AND SPREAD ON GROUND	75.00	2.20	1.65	75.24	
45	TYE REMAINING BAGS TOGETHER	65.00	2.53	1.65	76.89	
36	HAND THE PROPELLANT CHARGE TO NO. 1	70.00	2.33	1.63	78.52	
19	ASSIST NO. 1 IN INSPECTING AND CLEANING THE WRECH BLOCK, CH	62.50	2.58	1.61	80.13	
12	LAY COMMUNICATION CABLE FROM HOWITZER TO YW-155/GT	72.50	2.18	1.58	81.71	40
33	PREPARE PROPELLANT CHARGE	70.00	2.22	1.56	83.27	
37	VERIFY THAT PROJECTILE IS TYPE DESIGNATED IN COMMAND	72.50	2.13	1.54	84.81	
41	REMOVE COMPLETE CHARGE FROM CONTAINER, PLACING BASE CHARGE IN	65.00	2.25	1.46	86.28	
15	PREPARE TELEPHONE FOR USE AND CHECK OPERATION	70.00	2.08	1.46	87.73	
1	OPEN REAR HULL DOORS	77.50	1.76	1.34	89.09	45
24	RAISE AND SECURE BALLISTIC COVER	60.00	2.24	1.34	90.40	
53	SET SUPERQUICK AND DELAY FUZES WITH FUZE WRENCH	70.00	1.91	1.34	91.78	
44	REMOVE PROPELLANTS NOT REQUIRED	62.50	2.10	1.31	93.00	
51	REMOVE IGNITER PROTECTOR CAP FROM BASE CHARGE	55.00	2.30	1.24	94.35	
22	PLACE VENT CLEANING EQUIPMENT IN A CONVENIENT LOCATION	62.50	2.00	1.25	95.60	50
20	OPEN AND LOCK DIRECT FIRE TELESCOPE WINDOW	62.50	1.98	1.23	96.80	
54	READ AND ANNOUNCE TIME SET ON FUZE	65.00	1.83	1.19	98.03	
47	REMOVE SAFETY PULL WIRE FROM TIME FUZES	47.50	2.11	1.00	99.03	
29	REMOVE LIFTING PLUG	52.50	1.85	0.97	100.00	54

WEAPON CODE = 1 POSITION = 1 TASKS = 5 MEMBERS = 45

	COUNT OF TASKS LISTED	
ORDERED BY	CUMULATIVE AVERAGE PERCENT PART OF JOR BY ALL MEMBERS	.....
	AVERAGE PERCENT PART OF JOR BY ALL MEMBERS	.....
	AVERAGE PERCENT PART OF JOR BY MEMBERS PERFORMING	.....
	PERCENT OF MEMBERS PERFORMING	.....

3711 ASU

- 4 SPOT CHECK SETTINGS PLACED ON SIGHT
- 5 SPOT CHECK LAY OF MORTAR
- 3 RELAY/RECORD FIRE COMMANDS
- 1 DESIGNATE EXACT LOCATION MORTAR IS TO BE MOUNTED
- 2 INDICATE INITIAL DIRECTION OF FIRE

100.00	24.06	***	24.06
100.00	22.80	22.80	46.95
95.50	20.29	14.39	66.32
100.00	18.70	18.70	85.02
95.50	15.69	14.99	100.00

DRAGON PLATOON MORTAR JOB ANALYSIS GUNNER

WEAPON CODE = 1 POSITION = 2 TASKS = 33 MEMBERS = 49

COUNT OF TASKS LISTED			MEMBERS		
ORDERED BY.....	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	PERCENT OF MEMBERS PERFORMING.....	PERCENT OF MEMBERS PERFORMING.....	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	PERCENT OF MEMBERS PERFORMING.....
1	3.79	97.94	3.79	3.71	3.71
2	3.75	97.94	3.75	3.67	7.39
3	3.64	100.00	3.64	3.64	11.03
4	3.63	100.00	3.63	3.63	14.66
5	3.63	97.94	3.63	3.55	18.21
6	3.49	100.00	3.49	3.40	21.70
7	3.49	100.00	3.49	3.40	25.10
8	3.44	100.00	3.44	3.44	28.65
9	3.49	97.94	3.49	3.42	32.07
10	3.39	100.00	3.39	3.39	35.46
11	3.40	97.94	3.40	3.33	38.79
12	3.34	95.88	3.34	3.23	42.02
13	3.26	97.94	3.26	3.19	45.21
14	3.37	93.68	3.37	3.16	48.37
15	3.29	95.88	3.29	3.15	51.53
16	3.20	97.94	3.20	3.13	54.66
17	3.19	95.88	3.19	3.06	57.72
18	3.55	85.69	3.55	3.05	60.77
19	3.14	95.88	3.14	3.03	63.80
20	3.34	89.75	3.34	3.01	66.81
21	3.19	93.68	3.19	2.90	69.81
22	3.40	87.75	3.40	2.90	72.70
23	3.16	91.81	3.16	2.90	75.70
24	3.06	93.68	3.06	2.88	78.57
25	2.95	95.88	2.95	2.83	81.40
26	3.20	87.75	3.20	2.80	84.20
27	3.09	87.75	3.09	2.72	86.92
28	2.96	89.75	2.96	2.66	89.58
29	2.75	87.75	2.75	2.41	91.90
30	3.21	73.44	3.21	2.36	94.35

TASK TITLE

- *14 SET SIGHT FOR DEFLECTION AND ELEVATION ANNOUNCED IN FIRE COM
- *11 LAY MORTAR FOR INITIAL DIRECTION AND ELEVATION
- 33 ASSIST IN MAINTAINING MORTAR
- *9 ADJUST SIGHT FOR INITIAL LAY ON AIMING POSTS
- *4 MOUNT SIGHT ON MORTAR
- *30 REMOVE SIGHT FROM MORTAR BEFORE DISMOUNTING OF MORTAR
- 32 PARTICIPATE IN DISMOUNTING MORTAR
- *20 MANIPULATE TRAVERSING MECHANISM TO DELIVER TRAVERSING FIRE
- *10 DIRECT POSITIONING OF AIMING POSTS
- 31 REPLACE SIGHT IN SIGHT CASE
- *3 PARTICIPATE IN MOUNTING MORTAR
- 12 PERFORM BEFORE-FIRING SAFETY CHECKS ON MORTAR
- 13 REPEAT FIRE COMMAND ISSUED BY FDC OR FO
- 17 LAY MORTAR IN ACCORDANCE WITH SETTING PREVIOUSLY SET ON SIGHT
- 5 CALIBRATE SIGHT FOR ELEVATION USING M45 BORESIGHT
- 21 MANIPULATE ELEVATING MECHANISM TO DELIVER SEARCHING FIRE
- 2 PERFORM PRE-MOUNT CHECKS ON MOUNT
- 15 SET SIGHT FOR DEFLECTION AND ELEVATION CHANGES DIRECTED BY F
- 22 PARTICIPATE IN PARALLEL LAYING OF PLATOON MORTARS
- 18 CHANGE LAY OF MORTAR IN ACCORDANCE WITH MODIFIED SUBSEQUENT
- 29 LAY MORTAR FOR FINAL PROTECTIVE FIRE (FPF) DEFLECTION AND EL
- 28 ASSIST ASSISTANT GUNNER IN REMOVING MISFIRE
- 8 CALIBRATE SIGHT FOR DEFLECTION BY AIMING CIRCLE METHOD
- 7 CALIBRATE SIGHT FOR DEFLECTION USING M45 BORESIGHT
- 19 MANIPULATE ELEVATING MECHANISM AS REQUIRED TO ADJUST FIRE BY
- 25 REMOVE SIGHT BEFORE FIRING, UNTIL BASEPLATE IS SETTLED
- 26 CORRECT FOR DISPLACEMENT OF MOUNT DUE TO SHOCK OF FIRING
- 23 DIRECT LAY MORTAR
- 24 MOVE MOUNT AND BARREL TO MAKE LARGE DEFLECTION OR ELEVATION
- 27 ATTEMPT TO FIRE MISFIRE

DRAGON 81MM MORTAR FOR ANALYSTS GUNNER

TASK	TASK TITLE	X	X	X	X	X	N
1	CARRY MORTAR MOUNT	85.69	2.54	***	96.52		
6	CALIBRATE SIGHT FOR ELEVATION USING M2 COMPASS	79.54	2.29	2.17	98.34		
14	DETERMINE, BY REFERENCE TO FIRING TABLE, ELEVATION AND CHARGE	67.31	2.46	1.82	100.00		
				1.66			

WEAPON CODE = 1 POSITION = 3 TASKS = 13 MEMBERS = 29

ORDERED BY.....	COUNT OF TASKS LISTED.....	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....	PERCENT OF MEMBERS PERFORMING.....
1	1	100	100	100	100
2	1	100	100	100	100
3	1	100	100	100	100
4	1	100	100	100	100
5	1	100	100	100	100
6	1	100	100	100	100
7	1	100	100	100	100
8	1	100	100	100	100
9	1	100	100	100	100
10	1	100	100	100	100
11	1	100	100	100	100
12	1	100	100	100	100
13	1	100	100	100	100
14	1	100	100	100	100
15	1	100	100	100	100
16	1	100	100	100	100
17	1	100	100	100	100
18	1	100	100	100	100
19	1	100	100	100	100
20	1	100	100	100	100
21	1	100	100	100	100
22	1	100	100	100	100
23	1	100	100	100	100
24	1	100	100	100	100
25	1	100	100	100	100
26	1	100	100	100	100
27	1	100	100	100	100
28	1	100	100	100	100
29	1	100	100	100	100
30	1	100	100	100	100
31	1	100	100	100	100
32	1	100	100	100	100
33	1	100	100	100	100
34	1	100	100	100	100
35	1	100	100	100	100
36	1	100	100	100	100
37	1	100	100	100	100
38	1	100	100	100	100
39	1	100	100	100	100
40	1	100	100	100	100
41	1	100	100	100	100
42	1	100	100	100	100
43	1	100	100	100	100
44	1	100	100	100	100
45	1	100	100	100	100
46	1	100	100	100	100
47	1	100	100	100	100
48	1	100	100	100	100
49	1	100	100	100	100
50	1	100	100	100	100
51	1	100	100	100	100
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60	1	100	100	100	100
61	1	100	100	100	100
62	1	100	100	100	100
63	1	100	100	100	100
64	1	100	100	100	100
65	1	100	100	100	100
66	1	100	100	100	100
67	1	100	100	100	100
68	1	100	100	100	100
69	1	100	100	100	

57

WEAPON CODE = 1 POSITION = 4 TASKS = 17 MEMBERS = 7

COUNT OF TASKS LISTED									
TASK	TASK TITLE	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS							
		ORDERED BY							
		AVERAGE PERCENT PART OF JOB BY ALL MEMBERS							
		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING							
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PERCENT OF MEMBERS PERFORMING									
PERCENT OF MEMBERS PERFORMING									
PERCENT OF MEMBERS PERFORMING									

WEAPON CODE = 1 POSITION = 5 TASKS = 4 MEMBERS = 16

POINT OF TASKS LISTED.

ORDERED BY.....	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	?
	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....	?
	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....	?
	PERCENT OF MEMBERS PERFORMING.....	?

TASK

TASK TITLE

2 MAINTAIN AMMUNITION
4 PERFORM DUTIES OF 1ST AMMUNITION HANDLER
1 POSITION AIMING POSTS AS DIRECTED BY GUNNER
3 RETRIEVE AIMING POSTS

100.00	38.53	38.53	38.53
93.75	24.59	23.05	61.58
93.75	20.89	19.58	81.16
93.75	20.09	18.84	100.00

APPENDIX E

RANKED TASK INVENTORIES FOR THE

M60A2 TANK

M551 AR/AAV

105MM HOWITZER (TOWED)

155MM HOWITZER (TOWED)

8-INCH HOWITZER (SP)

4.2-INCH MORTAR

N60A2

TANK COMMANDER

TASK	TASK TITLE	COUNT OF TASKS LISTED									
		ORDERED BY	---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	N
9	ANNOUNCE AN INITIAL FIRE COMMAND.	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
11	LAY THE MAIN GUN FOR DIRECTION.	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
12	ANALYZE A TARGET RAPIDLY AND SELECT BEST AVAILABLE ATTENTION	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
17	PLACE THE RANGE FINDER IN OPERATION.	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
18	RANGE ON A TARGET, UTILIZING THE RANGE FINDER.	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
20	ANNOUNCE RANGE WHEN RANGE FINDER CANNOT MECHANICALLY TRANSMIT	100.00	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	5
3	LOAD AND CHARGE THE CUPOLA MACHINEGUN (50 CAL).	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
4	PREPARE TO FIRE THE CUPOLA MACHINEGUN.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
5	FIRE THE CUPOLA MACHINEGUN.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
7	UNLOAD A RUPTURED CARTRIDGE CASE FROM THE CUPOLA MACHINEGUN.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
10	TURN ON THE XEON SEARCHLIGHT.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
14	PROVIDE GUIDANCE TO THE GUNNER FOR LAYING THE MAIN GUN FOR D	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
41	OPERATE HEADSET AND CHEST SET.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
45	BORESIGHT AND ZERO THE 50 CAL MACHINEGUN.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
46	BORESIGHT AND ZERO THE MAIN GUN.	100.00	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	5
6	UNLOAD THE CUPOLA MACHINEGUN.	100.00	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	15
15	RELEASE CONTROL OF TURRET TO GUNNER UPON HEARING IDENTIFIED	100.00	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	15
43	FIRE FROM A RANGE CARD.	100.00	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	15
48	OPERATE TANK COMMANDER'S INFRARED CONTROLS AND EQUIPMENT.	100.00	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	15
47	SELECT FIRING POSITIONS.	100.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	15
13	DESIGNATE SPECIFIC TARGET WHEN MORE THAN ONE IS OBSERVED.	66.67	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	20
22	IDENTIFY TARGET PROVIDED BY THE PLATOON LEADER.	100.00	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	20
23	INSPECT FOR SAFETY OF CREW BEFORE TRAVERSING TURRET.	100.00	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	20
33	DISTINGUISH BETWEEN FRIENDLY AND ENEMY PERSONNEL AND MATERIAL	66.67	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	20
1	PLACE THE TURRET CUPOLA INTO POWER OPERATION.	66.67	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	25
2	DEACTIVATE THE TURRET CUPOLA FROM POWER OPERATION.	66.67	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	25
42	PREPARE A RANGE CARD.	66.67	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	25
21	IDENTIFY TARGET PROVIDED BY ANOTHER CREW MEMBER.	100.00	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	25
32	ESTIMATE SPEED OF MOVING TARGETS.	100.00	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	25

TANK COMMANDER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
8	RESPOND TO A CUPOLA MACHINEGUN MISFIRE.	66.67	3.23	2.15	90.11	30
38	ENGAGE TARGETS, UTILIZING ARTIFICIAL ILLUMINATION.	66.67	2.82	1.88	91.99	
16	MEASURE DEFLECTION SHIFT IN MILS, UTILIZING A REFERENCE POINT	66.67	2.58	1.72	93.71	
44	BORESIGHT AND ZERO THE COAXIAL MACHINEGUN.	33.33	3.23	1.08	94.78	
37	TROUBLESHOOT MALFUNCTIONS OF THE MAIN GUN.	66.67	1.53	1.02	95.81	35
40	READ THE COMPUTER.	33.33	2.58	0.86	96.67	
31	PERFORM THE NON-SENSING METHOD OF ADJUSTMENT.	66.67	1.13	0.75	97.42	
19	PURGE MAIN GUN HYDRAULIC SYSTEM.	33.33	0.65	0.22	97.63	
24	TURN ON APPROPRIATE GUN SWITCH.	33.33	0.65	0.22	97.85	
25	INDEX APPROPRIATE AMMUNITION.	33.33	0.65	0.22	98.06	
26	INDEX APPROPRIATE RANGE, IF REQUIRED.	33.33	0.65	0.22	98.28	40
27	APPLY MIL RELATION FORMULA.	33.33	0.65	0.22	98.50	
28	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING PE	33.33	0.65	0.22	98.71	
29	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING TE	33.33	0.65	0.22	98.92	
30	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT AGAINST A MOV	33.33	0.65	0.22	99.14	45
34	PREPARE TO FIRE COAXIAL MACHINEGUN.	33.33	0.65	0.22	99.35	
35	FIRE COAXIAL MACHINEGUN.	33.33	0.65	0.22	99.57	
36	FIRE COAXIAL MACHINEGUN AT A MOVING TARGET.	33.33	0.65	0.22	99.78	48
39	CHECK AZIMUTH INDICATOR FOR ACCURACY AND SLIPPAGE.	33.33	0.65	0.22	100.00	

N60A2

GUNNER

TASK	TASK TITLE	COUNT OF TASKS LISTED									
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.									
		ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.									
		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING PERCENT OF MEMBERS PERFORMING									
			%		%		%		%		N
4	TURN ON APPROPRIATE GUN SWITCH.	100.00	4.43	100.00	4.43	100.00	4.43	100.00	4.43	4.43	5
5	INDEX ANNOUNCED AMMUNITION.	100.00	4.43	100.00	4.43	100.00	4.43	100.00	4.43	8.86	
9	UPON RECEIPT OF RANGE ELEMENT OF THE FIRE COMMAND, MAKE A PR	100.00	3.82	100.00	3.82	100.00	3.82	100.00	3.82	12.68	
7	IDENTIFY THE TARGET.	100.00	3.60	100.00	3.60	100.00	3.60	100.00	3.60	16.28	
1	COMPLY WITH THE ELEMENTS OF A FIRE COMMAND.	100.00	3.22	100.00	3.22	100.00	3.22	100.00	3.22	19.50	
10	APPLY THE INITIAL LEAD FOR A MOVING TARGET.	100.00	3.22	100.00	3.22	100.00	3.22	100.00	3.22	22.72	
34	BORESIGHT AND ZERO THE COAXIAL MACHINEGUN.	100.00	3.22	100.00	3.22	100.00	3.22	100.00	3.22	25.93	
37	ENGAGE TARGETS, USING ARTIFICIAL ILLUMINATION.	100.00	3.22	100.00	3.22	100.00	3.22	100.00	3.22	29.15	
6	LOOK THROUGH VISION BLOCK TO LOCATE THE TARGET.	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	32.15	10
14	ANNOUNCE ON-THE-WAY AND FIRE.	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	35.14	
15	IF UTILIZING TELESCOPIC SIGHT, SELECT PROPER RETICLE AS INDI	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	38.14	
16	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT, UTILIZING THE	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	41.13	
17	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT, UTILIZING THE	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	44.13	
31	PREPARE A RANGE CARD.	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	47.13	15
32	FIRE FROM A RANGE CARD.	100.00	3.00	100.00	3.00	100.00	3.00	100.00	3.00	50.12	
3	PLACE THE TURRET IN POWER OPERATION	100.00	2.61	100.00	2.61	100.00	2.61	100.00	2.61	52.73	
26	DISTINGUISH BETWEEN FRIENDLY AND ENEMY PERSONNEL AND MATERIAL	100.00	2.61	100.00	2.61	100.00	2.61	100.00	2.61	55.34	
27	UPON DETECTION OF ENEMY TARGET, PROVIDE TANK COMMANDER WITH	100.00	2.61	100.00	2.61	100.00	2.61	100.00	2.61	57.95	
30	ASSIST LOADER IN LOCATING THE DIFFICULTY WHEN THE GUN FAILS	100.00	2.61	100.00	2.61	100.00	2.61	100.00	2.61	60.56	20
33	BORESIGHT AND ZERO THE MAIN GUN.	100.00	2.61	100.00	2.61	100.00	2.61	100.00	2.61	63.17	
12	LOCATE DIRECTION OF TARGET BY REFERENCE POINT WHEN REQUIRED.	100.00	2.55	100.00	2.55	100.00	2.55	100.00	2.55	65.73	
18	APPLY TANK COMMANDER'S CORRECTIONS FOR ADJUSTING FIRE, UTILI	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	68.12	
19	APPLY TANK COMMANDER'S CORRECTIONS FOR ADJUSTING FIRE, UTILI	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	70.51	
22	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT AGAINSTAA MOVING	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	72.90	
23	APPLY TANK COMMANDER'S CORRECTION FOR SUBSEQUENT ROUNDS AGAI	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	75.29	25
24	FIRE COAXIAL MACHINEGUN, USING INFINITY SIGHT IN THE VIEWING	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	77.68	
25	SEARCH FOR TARGETS THROUGH THE VIEWING WINDOW OF THE PERISCO	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	80.07	
28	ASSIST THE LOADER IF THE MAIN GUN FAILS TO LOAD	100.00	2.39	100.00	2.39	100.00	2.39	100.00	2.39	82.46	
8	POSITION THE PERISCOPE RETICLE TO FACILITATE RANGING.	100.00	2.33	100.00	2.33	100.00	2.33	100.00	2.33	84.79	30
29	ASSIST TANK COMMANDER IN LOCATING THE DIFFICULTY WHEN THE GUN	100.00	2.17	100.00	2.17	100.00	2.17	100.00	2.17	86.96	

GUNNER

(cont'd)

TASK	TASK TITLE	%	%	%	%	Z	N
35	BORESIGHT THE SEARCHLIGHT	100.00	2.17	2.17	2.17	89.13	
36	EMPLOY INFRARED SIGHTS.	100.00	2.17	2.17	2.17	91.30	
2	ASSURE TURRET TRAVERSING AREA IS CLEAR OF PERSONNEL AND OBST	66.67	3.00	3.00	2.00	93.31	
11	TRAVERSE RAPIDLY IN THE ANNOUNCED DIRECTION AS INDICATED BY	66.67	3.00	3.00	2.00	95.31	
13	INDEX THE RANGE, IF REQUIRED.	66.67	3.00	3.00	2.00	97.32	35
20	APPLY NON-SENSING METHOD OF ADJUSTMENT, WHEN REQUIRED	66.67	2.34	1.56	1.56	98.88	
21	ESTIMATE SPEED OF MOVING TARGET.	66.67	1.68	1.12	1.12	100.00	37

TASK	ORDERED BY ---	COUNT OF TASKS LISTED						
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS						
		AVERAGE PERCENT PART OF JOB BY ALL MEMBERS						
		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING						
		PERCENT OF MEMBERS PERFORMING						
TASK	TASK TITLE	%	%	%	%	%	N	
30	CHECK OPERATION OF THE INTERPHONE CONTROL BOX AND INTERPHONE	100.00	4.95	4.95	4.95	4.95	4.95	
1	IDENTIFY ALL TYPES OF TANK ACQUISITION	100.00	4.92	4.92	4.92	9.87		
2	AID TANK COMMANDER IN ACQUIRING TARGETS.	100.00	4.50	4.50	4.50	14.37		
27	MAINTAIN, INSTALL AND OPERATE HEADSET AND CHEST SET.	100.00	4.48	4.48	4.48	18.86		
10	DISASSEMBLE, MAINTAIN AND ASSEMBLE COAXIAL MACHINEGUN.	100.00	4.45	4.45	4.45	23.31		
11	INSTALL COAXIAL MACHINEGUN.	100.00	4.45	4.45	4.45	27.76		
16	UNLOAD THE COAXIAL MACHINEGUN.	100.00	4.45	4.45	4.45	32.22		
17	STOW MAIN GUN AMMUNITION.	100.00	3.96	3.96	3.96	36.17		
26	UNLOCK, MAINTAIN AND LOCK GUN TRAVEL LOCK.	100.00	3.51	3.51	3.51	39.69		
18	STOW COAXIAL MACHINEGUN AMMUNITION.	100.00	3.46	3.46	3.46	43.14	10	
31	ENTER PRESCRIBED RADIO NET.	100.00	3.09	3.09	3.09	46.24		
9	REMOVE COAXIAL MACHINEGUN.	100.00	2.96	2.96	2.96	49.20		
12	BORESIGHT COAXIAL MACHINEGUN.	100.00	2.96	2.96	2.96	52.16		
13	LOAD COAXIAL MACHINEGUN.	100.00	2.96	2.96	2.96	55.12		
14	TAKE IMMEDIATE ACTION IN CASE OF A STOPPAGE OF THE MACHINEGUN	100.00	2.96	2.96	2.96	58.08	15	
15	TAKE IMMEDIATE ACTION IN CASE OF A RUNAWAY COAXIAL MACHINEGUN	100.00	2.96	2.96	2.96	61.04		
24	CHECK TURRET BLOWER.	100.00	2.75	2.75	2.75	63.79		
29	READ REPLENISHMENT TAPE.	100.00	2.52	2.52	2.52	66.31		
19	UNLOAD A MAIN GUN ROUND FOR WHICH NO ATTEMPT HAS BEEN MADE TO	100.00	2.49	2.49	2.49	68.80	20	
20	UNLOAD A ROUND OR CARTRIDGE CASE THAT DOES NOT AUTOMATICALLY	100.00	2.49	2.49	2.49	71.29		
21	UNLOAD A ROUND BY USE OF RATCHING AND EXTRACTING TOOL.	100.00	2.49	2.49	2.49	73.78		
22	UNLOAD A STUCK PROJECTILE WHEN SEPARATED FROM THE CARTRIDGE	100.00	2.49	2.49	2.49	76.28		
28	REMOVE, INSTALL LOADER'S PERISCOPE.	100.00	2.49	2.49	2.49	78.77		
32	CHECK AND MAINTAIN OPERATION OF THE EXTERNAL INTERPHONE	100.00	2.49	2.49	2.49	81.26		
33	INSTALL, REMOVE AND OPERATE ALL RADIO COMPONENTS.	100.00	2.49	2.49	2.49	83.75	25	
13	DISPOSE OF EMPTY CARTRIDGE CASES.	100.00	2.31	2.31	2.31	86.06		
3	LOAD AMMUNITION ANNOUNCED BY THE TANK COMMANDER.	100.00	2.02	2.02	2.02	88.08		
4	INSURE SAFETY SWITCHES ARE ON OR OFF AS REQUIRED.	100.00	2.02	2.02	2.02	90.10		

LOADER

(cont'd)

TASK	TASK TITLE	%	%	%	%	%	N
5	ANNOUNCE UP WHEN THE WEAPON IS LOADED AND READY TO BE FIRED.	100.00	2.02	2.02	2.02	92.12	
6	INSURE PATH OF MAIN GUN RECOIL IS CLEAR.	100.00	2.02	2.02	2.02	94.15	30
7	CONTINUE TO LOAD UNTIL THE TANK COMMANDER ANNOUNCES CLASE FI	100.00	2.02	2.02	2.02	96.17	
8	SET AMMUNITION FUZES, IF REQUIRED.	100.00	2.02	2.02	2.02	98.19	
25	CHECK ODDMENT TRAYS, BRACKETS, GUN TOOL ROLL AND TURRET BUST	100.00	1.81	1.81	1.81	100.00	33

DRIVER

TASK	TASK TITLE	COUNT OF TASKS LISTED				CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS				N
		ORDERED BY	---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	PERCENT OF MEMBERS PERFORMING	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	PERCENT OF MEMBERS PERFORMING	%	%	
3	CHECK TRANSMISSION OIL.			100.00	7.10	7.10	7.10	7.10	5	
4	CHECK MAIN ENGINE OIL.			100.00	7.10	7.10	14.19	14.19		
13	TOW A DISABLED TANK.			100.00	6.70	6.70	20.90	20.90		
5	CHECK ACCIDENT IDENTIFICATION AND OPERATOR'S REPORT OF MOTOR			100.00	6.14	6.14	27.04	27.04		
14	FREE A BELLIED OR Mired TANK.			100.00	5.57	5.57	32.79	32.79		
10	DRIVE AT NIGHT.			100.00	5.58	5.58	38.38	38.38		
8	INSTALL AND OPERATE TANK HELMET COMMUNICATIONS			100.00	5.19	5.19	43.57	43.57		
1	DRIVE AND MANEUVER UNDER ALL WEATHER CONDITIONS AND OVER ALL			100.00	4.63	4.63	48.20	48.20		
6	REMOVE, INSPECT AND INSTALL DRIVER'S PERISCOPES.			100.00	4.63	4.63	52.83	52.83		
7	CLEAN, INSTALL AND REMOVE INFRARED PERISCOPE.			100.00	4.63	4.63	57.46	57.46		
9	FORD WATER OBSTACLE OF FORDING DEPTH.			100.00	4.63	4.63	62.09	62.09		
11	DRIVE WITH DRIVER'S HATCH CLOSED.			100.00	4.63	4.63	66.73	66.73		
12	DRIVE TANK IN TACTICAL FORMATIONS.			100.00	4.63	4.63	71.36	71.36		
16	STOP THE TANK ON TANK COMELANDER'S ORDER, BRINGING THE VEHICLE			100.00	4.63	4.63	75.99	75.99		
20	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING ROUGHNESS			100.00	4.63	4.63	80.62	80.62		
19	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING, ABRUPT CHA			100.00	4.29	4.29	84.91	84.91		
15	SEARCH FOR GOOD FIRING POSITIONS THAT AFFORD PROTECTION FOR			100.00	4.24	4.24	89.15	89.15		
17	DRIVE THE VEHICLE FORWARD SMOOTHLY WHEN MACHINEGUNS ARE USED			100.00	4.24	4.24	93.39	93.39		
2	FILL FUEL TANKS.			100.00	3.46	3.46	96.84	96.84		
18	AID THE TANK COMMANDER IN ACQUIRING TARGETS.			100.00	3.16	3.16	100.00	100.00		

M 1

COMMANDER

TASK	TASK TITLE	COUNT OF TASKS LISTED					PERCENT OF MEMBERS PERFORMING					N				
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	ORDERED BY	...	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	...	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	...	PERCENT OF MEMBERS PERFORMING	...	...	...	...	...	...	...
3	LOAD AND CHARGE THE CUPOLA MACHINEGUN (50 CAL).	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
4	PREPARE TO FIRE THE CUPOLA MACHINEGUN.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
5	FIRE THE CUPOLA MACHINEGUN.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
6	UNLOAD THE CUPOLA MACHINEGUN.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
9	ANNOUNCE AN INITIAL FIRE COMMAND.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
10	TURN ON THE NEON SEARCHLIGHT.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
12	ANALYZE A TARGET RAPIDLY AND SELECT BEST AVAILABLE AMMUNITION.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
13	DESIGNATE SPECIFIC TARGET WHEN MORE THAN ONE IS OBSERVED.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
15	RELEASE CONTROL OF TURRET TO GUNNER UPON HEARING IDENTIFIED.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
17	PLACE THE RANGE FINDER IN OPERATION.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
18	RANGE ON A TARGET, UTILIZING THE RANGE FINDER.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
20	ANNOUNCE RANGE WHEN RANGE FINDER CANNOT MECHANICALLY TRANSMIT	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
22	IDENTIFY TARGET PROVIDED BY THE PLATOON LEADER	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
23	INSPECT FOR SAFETY OF CREW BEFORE TRAVERSING TURRET.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
26	INDEX APPROPRIATE RANGE, IF REQUIRED.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
31	PERFORM THE NON-SENSING METHOD OF ADJUSTMENT.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
33	DISTINGUISH BETWEEN FRIENDLY AND ENEMY PERSONNEL AND MATERIAL	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
45	BORESIGHT AND ZERO THE 50 CAL MACHINEGUN.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
47	SELECT FIRING POSITIONS.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
48	OPERATE TANK COMMANDER'S INFRARED CONTROLS AND EQUIPMENT.	100.00	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
1	PLACE THE TURRET CUPOLA INTO POWER OPERATION.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
2	DEACTIVATE THE TURRET CUPOLA FROM POWER OPERATION.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
7	UNLOAD A RUPTURED CARTRIDGE CASE FROM THE CUPOLA MACHINEGUN.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
8	RESPOND TO A CUPOLA MACHINEGUN MISFIRE.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
11	LAY THE MAIN GUN FOR DIRECTION.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
37	TRIGGERSHOOT MALFUNCTIONS OF THE MAIN GUN.	100.00	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
27	APPLY MIL RELATION FORMULA.	100.00	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52
42	PREPARE A RANGE CARD.	100.00	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17
36	FIRE COAXIAL MACHINEGUN AT A MOVING TARGET.	100.00	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
41	OPERATE HEADSET AND CHEST SET.	100.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
35	FIRE COAXIAL MACHINEGUN.	100.00	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
14	PROVIDE GUIDANCE TO THE GUNNER FOR LAYING THE MAIN GUN FOR D	66.67	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43

M551

COMMANDER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
21	IDENTIFY TARGET PROVIDED BY ANOTHER CREW MEMBER.	66.67	2.43	1.62	82.97	
32	ESTIMATE SPEED OF MOVING TARGETS.	66.67	2.43	1.62	84.59	
38	ENGAGE TARGETS, UTILIZING ARTIFICIAL ILLUMINATION.	66.67	2.43	1.62	86.21	35
39	CHECK AZIMUTH INDICATOR FOR ACCURACY AND SLIPPAGE	66.67	2.43	1.62	87.83	
46	BORESIGHT AND ZERO THE MAIN GUN.	66.67	2.43	1.62	89.45	
16	MEASURE DEFLECTION SHIFT IN MILS, UTILIZING A REFERENCE POINT	66.67	2.20	1.47	90.92	
30	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT AGAINST A MOV	66.67	1.91	1.27	92.19	40
43	FIRE FROM A RANGE CARD.	66.67	1.65	1.10	93.29	
44	BORESIGHT AND ZERO THE COAXIAL MACHINEGUN.	66.67	1.42	0.95	94.23	
24	TURN ON APPROPRIATE GUN SWITCH.	66.67	1.39	0.92	95.16	
25	INDEX APPROPRIATE AMMUNITION.	66.67	1.39	0.92	96.08	
28	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING PE	66.67	1.39	0.92	97.01	45
29	PERFORM 'BURST-ON-TARGET' METHOD OF ADJUSTMENT, UTILIZING TE	66.67	1.39	0.92	97.93	
34	PREPARE TO FIRE COAXIAL MACHINEGUN.	66.67	1.20	0.80	98.73	
40	READ THE COMPUTER.	66.67	0.97	0.65	99.38	48
19	PURGE MAIN GUN HYDRAULIC SYSTEM.	66.67	0.94	0.62	100.00	

M551

GUNNER

ORDERED BY ...
 CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS
 AVERAGE PERCENT PART OF JOB BY ALL MEMBERS
 AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING
 PERCENT OF MEMBERS PERFORMING

TASK	TASK TITLE	%	%	%	%	N
7	IDENTIFY THE TARGET.	100.00	4.57	4.57	4.57	
2	ASSURE TURRET TRAVERSING AREA IS CLEAR OF PERSONNEL AND GBT	100.00	4.50	4.50	9.07	
12	LOCATE DIRECTION OF TARGET BY REFERENCE POINT WHEN REQUIRED	100.00	4.50	4.50	13.57	
33	BORESIGHT AND ZERO THE MAIN GUN.	100.00	4.50	4.50	18.08	
36	EMPLOY INFRARED SIGHTS.	100.00	4.17	4.17	22.24	5
31	PREPARE A RANGE CARD.	100.00	4.14	4.14	26.38	
32	FIRE FROM A RANGE CARD.	100.00	4.14	4.14	30.52	
13	INDEX THE RANGE, IF REQUIRED	100.00	3.76	3.76	34.29	
26	DISTINGUISH BETWEEN FRIENDLY AND ENEMY PERSONNEL AND MATERIAL	100.00	3.76	3.76	38.05	
34	BORESIGHT AND ZERO THE COAXIAL MACHINEGUN.	100.00	3.70	3.70	41.75	10
35	BORESIGHT THE SEARCHLIGHT.	100.00	3.43	3.43	45.18	
37	ENGAGE TARGETS, USING ARTIFICIAL ILLUMINATION	100.00	3.43	3.43	48.60	
23	APPLY TANK COMMANDER'S CORRECTION FOR SUBSEQUENT ROUNDS AGAIN	100.00	3.22	3.22	51.83	
15	IF UTILIZING TELESCOPIC SIGHT, SELECT PROPER RETICLE AS INDICATED	100.00	3.13	3.13	54.96	15
18	APPLY TANK COMMANDER'S CORRECTIONS FOR ADJUSTING FIRE, UTILIZING	100.00	2.95	2.95	57.91	
19	APPLY TANK COMMANDER'S CORRECTION FOR ADJUSTING FIRE, UTILIZING	100.00	2.95	2.95	60.87	
11	TRAVERSE RAPIDLY IN THE ANNOUNCED DIRECTION AS INDICATED BY	66.67	4.14	2.76	63.62	
28	ASSIST THE LOADER IF THE MAIN GUN FAILS TO LOAD.	100.00	2.75	2.75	66.38	
30	ASSIST LOADER IN LOCATING THE DIFFICULTY WHEN THE GUN FAILS	100.00	2.75	2.75	69.13	
20	APPLY NON-SENSING METHOD OF ADJUSTMENT, WHEN REQUIRED.	100.00	2.42	2.42	71.55	20
14	ANNOUNCE ON-THE-WAY AND FIRE.	66.67	3.53	2.35	73.90	
3	PLACE THE TURRET IN POWER OPERATION.	66.67	3.13	2.09	75.99	
1	COMPLY WITH THE ELEMENTS OF A FIRE COMMAND.	66.67	3.03	2.02	78.01	
4	TURN ON APPROPRIATE GUN SWITCH.	66.67	3.03	2.02	80.02	
10	APPLY THE INITIAL LEAD FOR A MOVING TARGET.	66.67	3.03	2.02	82.04	25
17	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT, UTILIZING THE	66.67	3.03	2.02	84.06	
24	FIRE COAXIAL MACHINEGUN, USING INFINITY SIGHT IN THE VIEWING	66.67	3.03	2.02	86.08	
29	ASSIST TANK COMMANDER IN LOCATING THE DIFFICULTY WHEN THE GUN	66.67	3.03	2.02	89.98	
27	UPON DETECTION OF ENEMY TARGET, PROVIDE TANK COMMANDER WITH	66.67	2.83	1.88	89.98	30
5	INDEX ANNOUNCED AMMUNITION.	66.67	2.62	1.75	91.73	
16	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT, UTILIZING THE	66.67	2.62	1.75	93.48	

GUNNER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
21	ESTIMATE SPEED OF MOVING TARGET.	66.67	1.82	1.21	94.69	
22	APPLY "BURST-ON-TARGET" METHOD OF ADJUSTMENT AGAINST A MOVING	66.67	1.82	1.21	95.90	
25	SEARCH FOR TARGETS THROUGH THE VIEWING WINDOW OF THE PERISCOPE	66.67	1.82	1.21	97.11	
8	POSITION THE PERISCOPE RETICLE TO FACILITATE RANGING.	66.67	1.71	1.14	98.25	35
9	UPON RECEIPT OF RANGE ELEMENT OF THE FIRE COMMAND, MAKE A PR	66.67	1.71	1.14	99.39	
6	LOOK THROUGH VISION BLOCK TO LOCATE THE TARGET.	66.67	0.91	0.61	100.00	37

M-1

LOADER

TASK	TASK TITLE	COUNT OF TASKS LISTED					%	PERCENT OF MEMBERS PERFORMING					N
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	ORDERED BY ... AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING							
4	INSURE SAFETY SWITCHES ARE ON OR OFF AS REQUIRED.	100.00	5.53	5.53	5.53	5.53	100.00	5.53	5.53	5.53	5		
15	TAKE IMMEDIATE ACTION IN CASE OF A RUNAWAY COAXIAL MACHINEGUN	100.00	5.53	5.53	5.53	5.53	100.00	5.53	5.53	5.53	10		
2	AID TANK COMMANDER IN ACQUIRING TARGETS.	100.00	5.06	5.06	5.06	5.06	100.00	5.06	5.06	5.06	5		
1	IDENTIFY ALL TYPES OF TANK AMMUNITION.	100.00	4.18	4.18	4.18	4.18	100.00	4.18	4.18	4.18	5		
27	MAINTAIN, INSTALL AND OPERATE HEADSET AND CHEST SET.	100.00	4.12	4.12	4.12	4.12	100.00	4.12	4.12	4.12	5		
23	DISPOSE OF EMPTY CARTRIDGE CASES.	100.00	3.95	3.95	3.95	3.95	100.00	3.95	3.95	3.95	5		
14	TAKE IMMEDIATE ACTION IN CASE OF A STOPPAGE OF THE MACHINEGUN	100.00	3.84	3.84	3.84	3.84	100.00	3.84	3.84	3.84	5		
30	CHECK OPERATION OF THE INTERPHONE CONTROL BOX AND INTERPHONE	100.00	3.72	3.72	3.72	3.72	100.00	3.72	3.72	3.72	5		
6	INSURE PATH OF MAIN GUN RECOIL IS CLEAR.	100.00	3.65	3.65	3.65	3.65	100.00	3.65	3.65	3.65	5		
12	BORESIGHT COAXIAL MACHINEGUN.	100.00	3.65	3.65	3.65	3.65	100.00	3.65	3.65	3.65	5		
21	UNLOAD A ROUND BY USE OF RAMMING AND EXTRACTING TOOL.	100.00	3.48	3.48	3.48	3.48	100.00	3.48	3.48	3.48	5		
10	DISASSEMBLE, MAINTAIN AND ASSEMBLE COAXIAL MACHINEGUN.	100.00	3.31	3.31	3.31	3.31	100.00	3.31	3.31	3.31	5		
25	CHECK ODDMENT TRAYS, BRACKETS, GUN TOOL ROLL AND TURRET BUST	100.00	3.19	3.19	3.19	3.19	100.00	3.19	3.19	3.19	5		
9	REMOVE COAXIAL MACHINEGUN.	100.00	3.08	3.08	3.08	3.08	100.00	3.08	3.08	3.08	5		
11	INSTALL COAXIAL MACHINEGUN.	100.00	3.08	3.08	3.08	3.08	100.00	3.08	3.08	3.08	5		
5	ANNOUNCE UP WHEN THE WEAPON IS LOADED AND READY TO BE FIRED.	100.00	2.96	2.96	2.96	2.96	100.00	2.96	2.96	2.96	5		
17	STOW MAIN GUN AMMUNITION.	100.00	2.96	2.96	2.96	2.96	100.00	2.96	2.96	2.96	5		
19	UNLOAD A MAIN GUN ROUND FOR WHICH NO ATTEMPT HAS BEEN MADE TO	100.00	2.96	2.96	2.96	2.96	100.00	2.96	2.96	2.96	5		
20	UNLOAD A ROUND OR CARTRIDGE CASE THAT DOES NOT AUTOMATICALLY	100.00	2.96	2.96	2.96	2.96	100.00	2.96	2.96	2.96	5		
26	UNLOCK, MAINTAIN AND LOCK GUN TRAVEL LOCK.	100.00	2.96	2.96	2.96	2.96	100.00	2.96	2.96	2.96	5		
22	UNLOAD A STUCK PROJECTILE WHEN SEPARATED FROM THE CARTRIDGE	100.00	2.73	2.73	2.73	2.73	100.00	2.73	2.73	2.73	5		
18	STOW COAXIAL MACHINEGUN AMMUNITION.	100.00	2.49	2.49	2.49	2.49	100.00	2.49	2.49	2.49	5		
29	READ REPLENISH TAPE.	100.00	2.49	2.49	2.49	2.49	100.00	2.49	2.49	2.49	5		
13	LOAD COAXIAL MACHINEGUN.	100.00	2.27	2.27	2.27	2.27	100.00	2.27	2.27	2.27	5		
31	ENTER PRESCRIBED RADIO NET.	100.00	2.20	2.20	2.20	2.20	100.00	2.20	2.20	2.20	5		
24	CHECK TURRET BLOWER.	100.00	2.04	2.04	2.04	2.04	100.00	2.04	2.04	2.04	5		
28	REMOVE, INSTALL LOADER'S PERISCOPE.	100.00	2.04	2.04	2.04	2.04	100.00	2.04	2.04	2.04	5		
33	INSTALL, REMOVE AND OPERATE ALL RADIO COMPONENTS.	100.00	1.97	1.97	1.97	1.97	100.00	1.97	1.97	1.97	5		
32	CHECK AND MAINTAIN OPERATION OF THE EXTERNAL INTERPHONE.	100.00	1.57	1.57	1.57	1.57	100.00	1.57	1.57	1.57	5		
3	LOAD AMMUNITION ANNOUNCED BY THE TANK COMMANDER.	66.67	2.33	2.33	2.33	2.33	66.67	2.33	2.33	2.33	5		
7	CONTINUE TO LOAD UNTIL THE TANK COMMANDER ANNOUNCES CEASE FI	66.67	2.33	2.33	2.33	2.33	66.67	2.33	2.33	2.33	5		

LOADER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
8	SET AMMUNITION FUZES, IF REQUIRED.	66.67	2.33	1.56	98.67	
16	UNLOAD THE COAXIAL MACHINEGUN.	66.67	1.99	1.33	100.00	33

DRIVER

Model

TASK	TASK TITLE	COUNT OF TASKS LISTED									
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	ORDERED BY ... AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	%	%	%	%	%	N
1	DRIVE AND MANEUVER UNDER ALL WEATHER CONDITIONS AND OVER ALL	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5
3	CHECK TRANSMISSION OIL.	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	10
4	CHECK MAIN ENGINE OIL.	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	15
7	CLEAN, INSTALL AND REMOVE INFRARED PERISCOPE	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	20
10	DRIVE AT NIGHT.	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5
11	DRIVE WITH DRIVER'S HATCH CLOSED.	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	10
12	DRIVE TANK IN TACTICAL FORMATIONS.	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	15
16	STOP THE TANK ON TANK COMMANDER'S ORDER, BRINGING THE VEHICLE	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	20
19	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING, ABRUPT CHA	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5
20	ALERT THE REST OF THE TANK CREW TO ANY IMPENDING ROUGHNESS	100.00	5.48	5.48	5.48	5.48	5.48	5.48	5.48	5.48	10
6	REMOVE, INSPECT AND INSTALL DRIVER'S PERISCOPES.	100.00	5.13	5.13	5.13	5.13	5.13	5.13	5.13	5.13	15
9	FORD WATER OBSTACLE OF FORDING DEPTH.	100.00	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	20
15	SEARCH FOR GOOD FIRING POSITIONS THAT AFFORD PROTECTION FOR	100.00	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5
17	DRIVE THE VEHICLE FORWARD SMOOTHLY WHEN MACHINEGUNS ARE USED	100.00	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	10
14	FREE A BELLIED OR NERED TANK.	100.00	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	15
5	CHECK ACCIDENT IDENTIFICATION AND OPERATOR'S REPORT OF MOTOR	100.00	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	20
18	AID THE TANK COMMANDER IN ACQUIRING TARGETS.	100.00	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	5
2	FILL FUEL TANKS.	100.00	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	10
13	TOW A DISABLED TANK.	100.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	15
8	INSTALL AND OPERATE TANK HELMET COMMUNICATIONS.	100.00	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	20

105mm

GRIEF OF SECTION

TASKS	TASKS TITLE	COUNT OF TASKS LISTED										N
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS										
		ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS										
		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING										
2	SUPERVISE OPERATION DURING ENTIRE SEQUENCE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26	5	
6	CHECK RECOIL SYSTEM	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
7	DIRECT SERVICING OF PIECE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
8	FOLLOW FIRE COMMANDS	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
10	INDICATE ALTERNATE AIMING POINT TO GUNNER	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
11	SELECT CLEARLY DEFINES POINT AT 1500 METERS OR MORE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
12	READ AND RECORD DEFLECTIONS FROM AZIMUTH COUNTER (ALTERNATE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
13	VERIFY THAT PIECE IS READY FOR ACTION	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
16	INSURE EFFICIENT AND SAFE OPERATION	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
17	FOLLOW AND REPEAT FIRE COMMANDS	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
19	GIVE COMMAND TO FIRE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
22	LAY FOR QUADRANT WITH GUNNER'S QUADRANT	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
25	GIVE COMMAND "CHECK FIRING"	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
26	IDENTIFY OR SELECT TARGET	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
28	ESTIMATE RANGE TO TARGET	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
29	DETERMINE LEAD IN MILS	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
31	GIVE SUBSEQUENT COMMANDS FOR CORRECTION IN LEAD AND RANGE	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
32	COMMANDS "END OF MISSION"	100.00	3.26	3.26	3.26	100.00	3.26	3.26	3.26	3.26		
9	MEASURE SITE TO GUN	100.00	3.12	3.12	3.12	100.00	3.12	3.12	3.12	3.12		
18	INDICATE WHEN PIECE IS READY TO FIRE	100.00	3.12	3.12	3.12	100.00	3.12	3.12	3.12	3.12		
14	REPORT ANY DEFECTS THAT WILL CAUSE DELAY TO NO	100.00	2.99	2.99	2.99	100.00	2.99	2.99	2.99	2.99		
20	CHECK FUNCTIONING OF MATERIAL DURING FIRING	100.00	2.99	2.99	2.99	100.00	2.99	2.99	2.99	2.99		
23	MEASURE QUADRANT ON INITIAL ROUND	100.00	2.99	2.99	2.99	100.00	2.99	2.99	2.99	2.99		
15	COMMAND FIRE OF PIECE ON COMMAND OF NO	100.00	2.86	2.86	2.86	100.00	2.86	2.86	2.86	2.86		
30	GIVE INITIAL COMMANDS IN SEQUENCE	100.00	2.86	2.86	2.86	100.00	2.86	2.86	2.86	2.86		
1	GIVE COMMAND "PREPARE FOR ACTION"	100.00	2.84	2.84	2.84	100.00	2.84	2.84	2.84	2.84		
21	REPORT ERRORS AND UNUSUAL INCIDENTS TO XO	100.00	2.76	2.76	2.76	100.00	2.76	2.76	2.76	2.76		

CHIEF OF SECTION

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
24	CONDUCT PREARRANGED FIRES	100.00	2.73	2.73	87.87	
27	IDENTIFY TARGET DESIGNATED BY XO	100.00	2.73	2.73	90.60	
5	CHECK POSITION OF REPLENISHER TAPE INDICATOR AND RECUPERATOR	83.33	3.24	2.70	93.30	30
33	GIVE FIRE COMMANDS WITH RANGE GIVEN IN FORM OF QUADRANT	100.00	2.62	2.62	95.92	
3	DIRECT BACKING OF CARRIAGE AGAINST SPADES	66.67	3.06	2.04	97.96	
4	DIRECT DRIVER TO CUT ENGINE AND SET BRAKES	66.67	3.06	2.04	100.00	33

GUNNER

COUNT OF TASKS LISTED.....									
CUMULATIVE AVERAGE PERCENT OF JOB BY ALL MEMBERS.....									
ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS.....									
AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING.....									
PERCENT OF MEMBERS PERFORMING.....									
TASK	TASK TITLE	%	%	%	%	%	%	%	N
10	UNCOVER AZIMUTH 6400-MIL COUNTER AND ZERO GUNNER'S AID COUNT	100.00	3.94	3.94	3.94	3.94	3.94	3.94	5
6	ASSIST DRIVER IN DISENGAGING TRAVELING LOCK	100.00	3.34	3.34	3.34	3.34	3.34	3.34	
5	CHECK CAB HYDRAULIC SYSTEM POWER PACK PRESSURE	80.00	3.40	2.72	2.72	2.72	2.72	2.72	
27	PLACE ANNOUNCED QUADRANT ON THE ELEVATION COUNTER	80.00	3.40	2.72	2.72	2.72	2.72	2.72	
12	LEVEL TELESCOPE MOUNT	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
13	TEST AND ALIGN (BORESIGHT) FIRE CONTROL EQUIPMENT	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
14	LAY HOWITZER FOR DIRECTION	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
15	IDENTIFY AIMING POINT THROUGH TELESCOPE	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
16	SET ANNOUNCED DEFLECTION ON AZIMUTH COUNTER	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
17	TRAVERSE CAB UNTIL RETICLE PATTERN OF TELESCOPE IS CENTERED	100.00	2.67	2.67	2.67	2.67	2.67	2.67	10
18	CHECKS THAT PITCH - AND CROSS-LEVEL BUBBLES ARE CENTERED	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
19	DIRECT ALIGNMENT OF AIMING POSTS AND/OR COLLIMATOR	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
21	SET AND LAY FOR DEFLECTION	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
24	CENTER PITCH -AND CROSS-LEVEL BUBBLES	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
30	PREPARE PANORAMIC TELESCOPE FOR DIRECT LAYING	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
32	SET INITIAL LEAD ON AZIMUTH COUNTER	100.00	2.67	2.67	2.67	2.67	2.67	2.67	15
34	MAINTAIN SIGHT PICTURE BY CONTINUOUS TRACKING OF TARGET	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
35	GIVE COMMAND "FIRE"	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
36	TURN AZIMUTH KNOB IN 5-MIL INCREMENTS TO SET LEAD CHANGES AS	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
37	LAY-FOR DEFLECTION	100.00	2.67	2.67	2.67	2.67	2.67	2.67	20
38	ANNOUNCE RANGE AND SET ELEVATION QUADRANT	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
40	CENTER CROSS-LEVEL BUBBLE ON THE PANORAMIC TELESCOPE MOUNT	100.00	2.67	2.67	2.67	2.67	2.67	2.67	
9	INSTALL PANORAMIC TELESCOPE	100.00	2.56	2.56	2.56	2.56	2.56	2.56	
23	TRAVERSE PIECE UNTIL VERTICAL RETICLE OF TELESCOPE IS ON LEF	100.00	2.56	2.56	2.56	2.56	2.56	2.56	
33	TRAVERSE HOWITZER UNTIL VERTICAL RETICLE IS CENTERED ON TARGET	100.00	2.56	2.56	2.56	2.56	2.56	2.56	25
4	CHECK EQUILLIBRATOR FLUID LEVEL	100.00	2.52	2.52	2.52	2.52	2.52	2.52	
7	CHECK FUNCTIONING OF TRAVERSING MECHANISM	100.00	2.52	2.52	2.52	2.52	2.52	2.52	

GUNNER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
26	PLACE GUNNER'S ELEVATING CONTROL SWITCH TO GUNNER	80.00	3.11	2.49	76.03	
25	CORRECT FOR DISPLACEMENT WHEN VERTICAL RETICLE IS DISPLACED	100.00	2.45	2.45	78.48	
20	LAY ON ALTERNATE AIMING POINT	100.00	2.41	2.41	80.88	30
22	SET ANNOUNCED DEFLECTION ON RESET COUNTER	80.00	2.82	2.25	83.14	
29	REFER PIECE	100.00	2.14	2.14	85.28	
2	PLACE CAB POWER SWITCH TO ON	80.00	2.54	2.03	87.31	
11	SET AZIMUTH COUNTER TO 3200 MILS	80.00	2.39	1.91	89.22	
31	ACTUATE CLICK SIGHT MECHANISM	80.00	2.39	1.91	91.13	35
39	ELEVATE HOWITZER UNTIL BUBBLE IN PITCH-LEVEL VIAL IS CENTERED	80.00	2.39	1.91	93.04	
3	SELECT NO. 1 GUNNER FOR POWER ELEVATION	80.00	2.25	1.80	94.83	
8	COMMAND DRIVER TO LIFT AND LOCK BALLISTIC COVER	80.00	2.25	1.80	96.63	
28	ELEVATE TUBE UNTIL ELEVATION-LEVEL BUBBLE IS CENTERED	80.00	2.25	1.80	98.43	
1	RELEASE CAB TRAVERSE LOCK	80.00	1.97	1.57	100.00	40

ORDERED BY	COUNT OF TASKS LISTED.	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS
---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	
	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	
	PERCENT OF MEMBERS PERFORMING.	

TASKS	TASK TITLE	%	%	%	%	N
16	INSURE BUBBLES ARE CENTERED	100.00	8.65	8.65	8.65	
2	CHECK FUNCTIONING OF ELEVATING MECHANISMS	100.00	8.37	8.37	17.03	
27	ELEVATE OR DEPRESS PIECE UNTIL APPROPRIATE RANGE LINE IS ON	100.00	8.09	8.09	25.12	
4	INSURE CROSS-LEVEL BUBBLE IS CENTERED	100.00	7.66	7.66	32.77	
24	ELEVATE OR DEPRESS PIECE UNTIL TARGET IS ON APPROPRIATE RANG	100.00	7.40	7.40	40.18	5
3	DEPRESS OR ELEVATE TUBE TO LOADING ELEVATION	100.00	6.99	6.99	47.17	
14	ELEVATE PIECE TO ANNOUNCED QUADRANT AFTER LOADING	80.00	6.94	5.55	52.71	
12	SET ANNOUNCED QUADRANT ON ELEVATION COUNTER WITH ELEVATION K	80.00	6.33	5.06	57.78	
15	INSURE APPROPRIATE SETTINGS ON ELEVATING QUADRANT	80.00	6.21	4.97	62.74	
21	PREPARE DIRECT FIRE TELESCOPE	80.00	5.85	4.68	67.43	10
26	MAINTAIN TARGET ON APPROPRIATE RANGE LINE BY CONTINUOUS TRAC	80.00	5.27	4.22	71.64	
1	ELEVATE TUBE CLEAR OF HOWITZER TRAVELING LOCK	60.00	5.74	3.45	75.09	
5	SET CORRECTION COUNTER TO ZERO	80.00	4.07	3.26	78.34	
17	CALLS "SET" WHEN PIECE HAS BEEN LAID FOR RANGE	60.00	4.80	2.88	81.23	
6	ASSIT CHIEF OF SECTION IN MEASURING SITE TO CREST	60.00	4.49	2.70	83.92	15
8	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION	60.00	4.33	2.60	86.52	
7	CHECK DIRECT FIRE TELESCOPE	60.00	4.19	2.51	89.04	
13	PLACE TUBE AT LOADING POSITION, DEPENDING ON TYPE OF RANGHER	60.00	3.57	2.14	91.18	
18	PLACE TUBE AT LOADING POSITION AFTER EACH ROUND IS FIRED, DE	40.00	4.43	1.77	92.95	
22	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION	40.00	3.02	1.21	94.15	20
23	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING	40.00	2.56	1.02	95.18	
10	CENTER CANT CORRECTION BUBBLE	20.00	4.63	0.93	96.10	
11	VERIFY THAT ELEVATION AND AZIMUTH SLIP SCALES ARE SET AT 4	20.00	4.63	0.93	97.03	
9	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING	40.00	1.87	0.75	97.78	25
19	CLEAN OBTURATOR VENT AND PRIMER SEAT	20.00	3.70	0.74	98.52	
20	SWAB OUT BORE, WASH POWDER RESIDUE FROM OBTURATOR HEAD, THE	20.00	3.70	0.74	99.26	27
25	CHECK LEVEL VIAL MIRROR AND ADJUST FOR CANT TO CENTER BUBBLE	20.00	3.70	0.74	100.00	

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2ND CANNONEER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
12	LAY COMMUNICATION CABLE FROM HOWITZER TO M-155/GT	42.86	4.15	1.77	81.87	
40	PLACE PROJECTILE NEAR NO. 1	57.14	3.01	1.72	83.59	
30	ASSIST NO. 5 IN PREPARING THE PROPELLANT CHARGE	42.86	3.50	1.50	85.09	30
6	ASSIST NO. 4 AND 5 IN UNLOADING AND ARRANGING AMMUNITION	57.14	2.57	1.47	86.56	
33	PREPARE PROPELLANT CHARGE	42.86	3.39	1.45	88.01	
11	UNLOAD AND ARRANGE PROPELLING CHARGES	42.86	3.30	1.42	89.43	
37	VERIFY THAT PROJECTILE IS TYPE DESIGNATED IN COMMAND	57.14	2.33	1.33	90.76	
15	PREPARE TELEPHONE FOR USE AND CHECK OPERATION	57.14	2.13	1.22	91.97	35
23	LOWER AND SECURE HOWITZER TRAVELING LOCK	57.14	2.13	1.22	93.19	
7	DROP THE RIGHT SPADE	42.86	2.55	1.09	94.28	
22	PLACE VENT CLEANING EQUIPMENT IN A CONVENIENT LOCATION	42.86	2.55	1.09	95.38	
19	ASSIST NO. 1 IN INSPECTING AND CLEANING THE BREECH BLOCK, CH	42.86	2.11	0.90	96.28	
8	SET BRAKE AND STOP ENGINE	28.57	2.74	0.78	97.07	40
45	TIE REMAINING BAGS TOGETHER	28.57	2.74	0.78	97.85	
17	REMOVE MUZZLE PLUG	42.86	1.71	0.73	98.58	
41	REMOVE COMPLETE CHARGE FROM CONTAINER, PLACING BASE CHARGE O	28.57	2.44	0.70	99.28	
44	REMOVE PROPELLANTS NOT REQUIRED	28.57	2.44	0.70	99.98	
39	REMOVE GROMMET AND EXAMINE ROTATING BAND FOR DIRT OR BURRS	28.57	2.14	0.61	100.59	45
20	OPEN AND LOCK DIRECT FIRE TELESCOPE WINDOW	28.57	1.85	0.53	101.12	
24	RAISE AND SECURE BALLISTIC COVER	28.57	1.85	0.53	101.64	
3	REMOVE PAULIN FROM CAB STORAGE RACK AND SPREAD ON GROUND	100.00	0.43	0.43	102.07	
2	EACK CARRIAGE AGAINST SPADES	100.00	0.34	0.34	102.41	
27	PLACE INSTRUMENT PANEL INSIDE DRIVER'S COMPARTMENT AND CLOSE	14.29	2.38	0.34	102.75	50
28	SECURE DRIVER'S HATCH	14.29	2.39	0.34	103.09	
29	REMOVE LIFTING PLUG	14.29	1.19	0.17	103.26	
1	OPEN REAR HULL DOORS	100.00	0.09	0.09	103.34	
4	ASSIST NO. 3 IN PREPARING PAULIN	100.00	0.09	0.09	103.43	54

THE UNIVERSITY OF CHICAGO

TASKS	TASK TITLE	%	%	%	N
2	SUPERVISE OPERATION DURING ENTIRE SEQUENCE	100.00	3.42	3.42	3.42
6	CHECK RECOIL SYSTEM	100.00	3.42	3.42	6.84
9	MEASURE SITE TO CRPT	100.00	3.42	3.42	10.26
10	INDICATE ALTERNATE AIMING POINT TO GUNNER	100.00	3.42	3.42	13.68
13	VERIFY THAT PIECE IS READY FOR ACTION	100.00	3.42	3.42	17.10
15	COMMAND FIRE OF PIECE ON COMMAND OF XO	100.00	3.42	3.42	20.52
16	INSURE EFFICIENT AND SAFE OPERATION	100.00	3.42	3.42	23.94
17	FOLLOW AND REPEAT FIRE COMMANDS	100.00	3.42	3.42	27.35
18	INDICATE WHEN PIECE IS READY TO FIRE	100.00	3.42	3.42	30.77
19	GIVE COMMAND TO FIRE	100.00	3.42	3.42	34.19
21	REPORT ERRORS AND UNUSUAL INCIDENTS TO XO	100.00	3.42	3.42	37.61
25	GIVE COMMAND "CHECK FIRING"	100.00	3.42	3.42	41.03
28	ESTIMATE RANGE TO TARGET	100.00	3.42	3.42	44.45
30	GIVE INITIAL COMMANDS IN SEQUENCE	100.00	3.42	3.42	47.87
31	GIVEN SUBSEQUENT COMMANDS FOR CHANGE IN LEAD AND RANGE	100.00	3.42	3.42	51.29
14	REPORT ANY DEFECTS THAT WILL CAUSE DELAY TO XO	100.00	3.25	3.25	54.54
33	GIVE FIRE COMMANDS WITH RANGE GIVEN IN FORM OF QUADRANT	100.00	3.25	3.25	57.80
20	CHECK FUNCTIONING OF MATERIAL DURING FIRING	100.00	3.24	3.24	61.04
27	IDENTIFY TARGET DESIGNATED BY XO	100.00	3.24	3.24	64.27
8	FOLLOW FIRE COMMANDS	100.00	3.09	3.09	67.36
7	DIRECT SERVICING OF PIECE	100.00	3.07	3.07	70.43
11	SELECT CLEARLY DEFINED POINT AT 1500 METERS OR MORE	100.00	3.07	3.07	73.51
23	MEASURE QUADRANT ON INITIAL ROUND	100.00	3.06	3.06	76.56
24	CONDUCT PREARRANGED FIRES	100.00	3.06	3.06	79.62
1	GIVE COMMAND "PREPARE FOR ACTION"	100.00	2.88	2.88	82.50
22	LAY FOR QUADRANT WITH GUNNER'S QUADRANT	100.00	2.88	2.88	85.38
29	DETERMINE LEAD IN MILS	100.00	2.60	2.60	87.98
26	IDENTIFY OR SELECT TARGET	100.00	2.57	2.57	90.55

CHIEF OF SECTION

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
5	CHECK POSITION OF REPLENISHMENT TAPE INDICATOR AND RECUPERATOR	75.00	3.15	2.36	92.91	
32	COMMANDS "END OF MISSION"	75.00	3.02	2.26	95.18	30
12	READ AND RECORD DEFLECTIONS FROM AZIMUTH COUNTER (ALTERNATE	75.00	2.94	2.21	97.38	
3	DIRECT BACKING OF CARRIAGE AGAINST SPADES	50.00	2.62	1.31	98.69	
4	DIRECT DRIVER TO CUT ENGINE AND SET BRAKES	50.00	2.61	1.31	100.00	33

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TASKS	TASK TITLE	COUNT OF TASKS LISTED				CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS				N
		ORDERED BY ---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	%	%	%	%	
9	INSTALL PANORAMIC TELESCOPE				100.00	3.70	3.70	3.70	3.70	5
12	LEVEL TELESCOPE MOUNT				100.00	3.70	3.70	3.70	3.70	10
14	LAY HORIZONTER FOR DIRECTION				100.00	3.70	3.70	3.70	3.70	15
15	IDENTIFY AIMING POINT THROUGH TELESCOPE				100.00	3.70	3.70	3.70	3.70	20
19	DIRECT ALIGNMENT OF AIMING POSTS AND/OR COLLIMATOR				100.00	3.70	3.70	3.70	3.70	25
34	MAINTAIN SIGHT PICTURE BY CONTINUOUS TRACKING OF TARGET				100.00	3.70	3.70	3.70	3.70	30
18	CHECKS THAT PITCH - AND CROSS-LEVEL BUBBLES ARE CENTERED				100.00	3.60	3.60	3.60	3.60	35
21	SET AND LAY FOR DEFLECTION				100.00	3.60	3.60	3.60	3.60	40
23	TRAVERSE PIECE UNTIL VERTICAL RETICLE OF TELESCOPE IS ON LEFT				100.00	3.60	3.60	3.60	3.60	45
24	CENTER PITCH - AND CROSS-LEVEL BUBBLES ARE CENTERED				100.00	3.60	3.60	3.60	3.60	50
13	TEST AND ALIGN (BORESIGHT) FIRE CONTROL EQUIPMENT				100.00	3.37	3.37	3.37	3.37	55
20	LAY ON ALTERNATE AIMING POINT				100.00	3.36	3.36	3.36	3.36	60
33	TRAVERSE HORIZONTER UNTIL VERTICAL RETICLE IS CENTERED ON TARG				87.50	3.63	3.18	3.18	46.50	65
16	SET ANNOUNCED DEFLECTION ON AZIMUTH COUNTER				87.50	3.55	3.10	3.10	49.60	70
29	REFER PIECE				87.50	3.54	3.10	3.10	52.70	75
35	GIVE COMMAND "FIRE"				87.50	3.54	3.10	3.10	55.79	80
25	CORRECT FOR DISPLACEMENT WHEN VERTICAL RETICLE IS DISPLACED				87.50	3.52	3.08	3.08	58.87	85
30	PREPARE PANORAMIC TELESCOPE FOR DIRECT LAYING				87.50	3.44	3.01	3.01	61.89	90
37	LAY FOR DEFLECTION				87.50	3.44	3.01	3.01	64.90	95
39	ELEVATE HORIZONTER UNTIL BUBBLE IN PITCH-LEVEL VIAL IS CENTERED				87.50	3.44	3.01	3.01	67.92	100
28	ELEVATE TUBE UNTIL ELEVATION-LEVEL BUBBLE IS CENTERED				87.50	3.42	3.00	3.00	70.91	105
4	CHECK EQUILIBRATOR FLUID LEVEL				100.00	2.81	2.81	2.81	73.73	110
27	PLACE ANNOUNCED QUADRANT ON THE ELEVATION COUNTER				75.00	3.60	2.70	2.70	76.43	115
7	CHECK FUNCTIONING OF TRAVERSING MECHANISM				75.00	3.49	2.62	2.62	79.04	120
40	CENTER CROSS-LEVEL BUBBLE ON THE PANORAMIC TELESCOPE MOUNT				75.00	3.40	2.55	2.55	81.60	125
26	TURN AZIMUTH KNOB IN 3-MILLICENTIMETERS TO SET LEAD CHANGES AS				75.00	3.38	2.53	2.53	84.13	130

GUNNER

(cont'd)

TASK	TASK TITLE	%	%	%	%	%	N
11	SET AZIMUTH COUNTER TO 3200 MILS	62.50	3.58	2.23	86.34		
22	SET ANNOUNCED DEFLECTION ON RESET COUNTER	62.50	3.55	2.22	88.58		
38	ANNOUNCE RANGE AND SET ELEVATION QUADRANT	62.50	3.41	2.13	90.71		
10	UNCOVER AZIMUTH 6400-MIL COUNTER AND ZERO GUNNER'S AID COUNT	50.00	3.51	1.75	92.47		30
32	SET INITIAL LEAD ON AZIMUTH COUNTER	50.00	3.24	1.62	94.08		
26	PLACE GUNNER'S ELEVATING CONTROL SWITCH TO GUNNER	37.50	3.12	1.17	95.26		
17	TRAVERSE CAB UNTIL RETICLE PATTERN OF TELESCOPE IS CENTERED	37.50	3.07	1.15	96.41		
6	ASSIST DRIVER IN DISENGAGING TRAVELING LOCK	50.00	1.70	0.85	97.26		
31	ACTUATE CLICK SIGHT MECHANISM	25.00	2.95	0.74	97.99		35
5	CHECK CAB HYDRAULIC SYSTEM POWER PACK PRESSURE	25.00	2.28	0.57	98.56		
3	SELECT NO. 1 GUNNER FOR POWER ELEVATION	25.00	1.73	0.43	99.00		
1	RELEASE CAB TRAVERSE LOCK	12.50	2.67	0.33	99.33		
2	PLACE CAB POWER SWITCH TO ON	12.50	2.67	0.33	99.67		
8	COMMAND DRIVER TO LIFT AND LOCK BALLISTIC COVER	12.50	2.67	0.33	100.00		40

155 Towed

ASSISTANT GUNNER

COUNT OF TASKS LISTED.									
ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS									
AVERAGE PERCENT PART OF JOB BY ALL MEMBERS									
AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING									
PERCENT OF MEMBERS PERFORMING									
TASKS	TASK TITLE	%	%	%	%	%	%	%	N
19	CLEAN OBTURATOR VENT AND PRIMER SEAT	85.71	16.35	14.01	14.01	14.01	14.01	14.01	5
17	CALLS "SET" WHEN PIECE HAS BEEN LAID FOR RANGE	85.61	12.09	10.36	10.36	10.36	10.36	10.36	10
20	SWAB OUT BORE, WASH POWDER RESIDUE FROM OBTURATOR HEAD, THE	71.43	9.26	6.61	6.61	6.61	6.61	6.61	15
21	PREPARE DIRECT FIRE TELESCOPE	85.71	7.41	6.35	6.35	6.35	6.35	6.35	20
6	ASSIST CHIEF OF SECTION IN MEASURING SITE TO CREST	85.71	6.88	5.91	5.91	5.91	5.91	5.91	25
1	ELEVATE TUBE CLEAR OF HOWITZER TRAVELING LOCK	71.43	3.54	3.24	3.24	3.24	3.24	3.24	27
12	SET ANNOUNCED QUADRANT ON ELEVATION COUNTER WITH ELEVATION K	71.43	4.54	3.24	3.24	3.24	3.24	3.24	
7	CHECK DIRECT FIRE TELESCOPE	71.43	4.40	3.14	3.14	3.14	3.14	3.14	
13	PLACE TUBE AT LOADING POSITION, DEPENDING ON TYPE OF RAMMER	71.43	4.18	2.98	2.98	2.98	2.98	2.98	
14	ELEVATE PIECE TO ANNOUNCED QUADRANT AFTER LOADING	71.43	4.18	2.98	2.98	2.98	2.98	2.98	
15	INSURE APPROPRIATE SETTINGS ON ELEVATING QUADRANT	71.43	4.18	2.98	2.98	2.98	2.98	2.98	
18	PLACE TUBE AT LOADING POSITION AFTER EACH ROUND IS FIRED, DE	71.43	3.84	2.74	2.74	2.74	2.74	2.74	
4	INSURE CROSS-LEVEL BUBBLE IS CENTERED	71.43	3.81	2.72	2.72	2.72	2.72	2.72	
10	CENTER CANT CORRECTION BUBBLE	71.43	3.81	2.72	2.72	2.72	2.72	2.72	
16	INSURE BUBBLES ARE CENTERED	71.43	3.81	2.72	2.72	2.72	2.72	2.72	
24	ELEVATE OR DEPRESS PIECE UNTIL TARGET IS ON APPROPRIATE RANGE	71.43	3.81	2.72	2.72	2.72	2.72	2.72	
27	ELEVATE OR DEPRESS PIECE UNTIL APPROPRIATE RANGE LINE IS ON	71.43	3.81	2.72	2.72	2.72	2.72	2.72	
2	CHECK FUNCTIONING OF ELEVATING MECHANISMS	71.43	3.73	2.67	2.67	2.67	2.67	2.67	
22	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION	71.43	3.64	2.60	2.60	2.60	2.60	2.60	
26	MAINTAIN TARGET ON APPROPRIATE RANGE LINE BY CONTINUOUS TRAC	71.43	3.64	2.60	2.60	2.60	2.60	2.60	
8	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION	71.43	3.33	2.38	2.38	2.38	2.38	2.38	
9	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING	71.43	3.23	2.31	2.31	2.31	2.31	2.31	
3	DEPRESS OR ELEVATE TUBE TO LOADING ELEVATION	71.43	3.01	2.15	2.15	2.15	2.15	2.15	
25	CHECK LEVEL VIAL MIRROR AND ADJUST FOR CANT TO CENTER BUBBLE	71.43	2.64	1.89	1.89	1.89	1.89	1.89	
23	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING	71.43	2.47	1.77	1.77	1.77	1.77	1.77	
5	SET CORRECTION COUNTER TO ZERO	71.43	2.47	1.77	1.77	1.77	1.77	1.77	
11	VERIFY THAT ELEVATION AND AZIMUTH SLIP SCALES ARE SET AT 4	71.43	2.40	1.72	1.72	1.72	1.72	1.72	

155 Towed

NO. 1 CANNONEER

COUNT OF TASKS LISTED									
ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS									
AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING									
PERCENT OF MEMBERS PERFORMING									
TASK	TASK TITLE	%	%	%	%	%	%	%	N
12	PLACE PROPELLANT CHARGE IN CHAMBER	88.89	17.63	15.67	15.67	15.67	15.67	15.67	5
6	PROCURE PRIMERS AND PLACE IN CONVENIENT LOCATION	77.78	12.56	9.77	25.44	25.44	25.44	25.44	5
17	SWAB AND INSPECT THE POWDER CHAMBER	77.78	10.08	7.84	33.28	33.28	33.28	33.28	5
10	MOVE RAMMER CYLINDER TO RAM POSITION	77.78	8.71	6.78	40.05	40.05	40.05	40.05	5
4	INSPECT, OPERATE, AND CLEAN BREECH BLOCK, RAMMER, CHAMBER,	77.78	8.67	6.74	46.80	46.80	46.80	46.80	5
5	PROCURE SPONGE, BURLAP, AND BUCKET OF WATER AND PLACE IN CON	77.78	8.50	6.61	53.40	53.40	53.40	53.40	5
13	COMMAND "CLOSE" AND CLOSE THE BREECH	66.67	9.90	6.60	60.00	60.00	60.00	60.00	5
9	PLACE PROJECTILE IN LOADING TRAY OF POWER RAMMER	77.78	7.48	5.82	65.82	65.82	65.82	65.82	5
3	OPERATE FIRING MECHANISM	66.67	6.90	4.60	70.42	70.42	70.42	70.42	5
11	RETURN RAMMER TO STOWED POSITION	77.78	5.51	4.29	74.70	74.70	74.70	74.70	5
7	LOWER RAMMER TO OPERATING POSITION	66.67	5.69	3.79	78.49	78.49	78.49	78.49	5
14	INSERT PRIMER IN PRIMER CHAMBER, CLOSE BLOCK ASSEMBLY, AND P	55.56	6.61	3.67	82.17	82.17	82.17	82.17	5
15	ATTACH FIRING LANYARD TO FIRING MECHANISM LEVER	55.56	5.83	3.24	85.41	85.41	85.41	85.41	5
16	FIRE HOWITZER ON COMMAND	55.56	5.66	3.14	88.55	88.55	88.55	88.55	5
2	REMOVE LEFT SPADE STRUT SAFETY PIN, RELEASE LOCKING LATCH, A	66.67	4.71	3.14	91.69	91.69	91.69	91.69	5
8	RELEASE RAMMER CYLINDER LATCH	55.56	5.29	2.94	94.63	94.63	94.63	94.63	5
1	OPEN REAR TURRET DOORS	44.44	6.20	2.76	97.38	97.38	97.38	97.38	5
18	CALL OUT NUMBER AND QUADRANT FOR EACH ROUND IN VOLLEY FIRE	55.56	4.71	2.62	100.00	100.00	100.00	100.00	5

TASK	TASK TITLE	%	%	%	N
34	ASSIST NO. 3 AND 4 IN PREPARING AMMUNITION	100.00	3.39	3.39	3.39
6	ASSIST NO. 4 AND 5 IN UNLOADING AND ARRANGING AMMUNITION	100.00	3.11	3.11	6.50
5	UNLOAD AND ARRANGE EQUIPMENT AS DIRECTED BY THE CHIEF OF SEC	93.33	3.14	2.93	9.43
10	UNLOAD AND ARRANGE PROJECTILES	93.33	2.99	2.79	12.22
32	CARRY PROJECTILE TO HOWITZER	86.67	3.05	2.64	14.87
11	UNLOAD AND ARRANGE PROPELLING CHARGES	93.33	2.68	2.50	17.37
25	UNLOAD AIMING POSTS, RAMMER STAFF SECTIONS AND PIONEER EQUIP	93.33	2.65	2.47	19.84
23	LOWER AND SECURE HOWITZER TRAVELING LOCK	93.33	2.61	2.44	22.28
43	EXAMINE ENTIRE PROJECTILE FOR DEFECTS	86.67	2.71	2.35	24.62
31	INSPECT AND CLEAN PROJECTILES	93.33	2.49	2.32	26.94
26	ASSEMBLE RAMMER STAFF AND HEAD	93.33	2.40	2.24	29.19
51	REMOVE IGNITER PROTECTOR CAP FROM BASE CHARGE	66.67	3.24	2.16	31.35
9	ASSIST NO. 2 IN UNLOADING FUZE BOXES AND OPENING AND ARRANGI	86.67	2.45	2.12	33.47
33	PREPARE PROPELLANT CHARGE	80.00	2.63	2.10	35.57
54	READ AND ANNOUNCE TIME SET ON FUZE	80.00	2.62	2.10	37.67
8	SET BRAKE AND STOP ENGINE	66.67	3.14	2.10	39.76
28	SECURE DRIVER'S HATCH	66.67	3.14	2.10	41.86
42	ATTACH DESIGNATED FUZE	80.00	2.55	2.04	43.90
27	PLACE INSTRUMENT PANEL INSIDE DRIVER'S COMPARTMENT AND CLOSE	60.00	3.38	2.03	45.93
30	ASSIST NO. 5 IN PREPARING THE PROPELLANT CHARGE	86.67	2.31	2.00	47.93
35	INSPECT FUZE WELL FOR RUST AND DIRT	86.67	2.31	2.00	49.93
52	HOLD PROJECTILE WHILE NO. 2 FUZES AND SETS FUZE	80.00	2.49	1.99	51.93
50	SET TIME FUZES USING APPROPRIATE FUZE SETTER	80.00	2.44	1.95	53.88
18	EMPLACE AND HOLD TESTING TARGET	86.67	2.25	1.95	55.83
38	SELECT CHARGE DESIGNATED BY XO	80.00	2.40	1.92	57.75
17	REMOVE MUZZLE PLUG	86.67	2.20	1.91	59.66
21	SET OUT AIMING POSTS	86.67	2.16	1.87	61.53
4	ASSIST NO. 3 IN PREPARING PAULIN	100.00	1.83	1.83	63.36

CANNONEERS NOS. 2-6 AND DRIVER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
2	BACK CARRIAGE AGAINST SPADES	100.00	1.81	1.81	65.17	
53	SET SUPERQUICK AND DELAY FUZES WITH FUZE WRENCH	73.33	2.46	1.81	66.97	30
41	REMOVE COMPLETE CHARGE FROM CONTAINER, PLACING BASE CHARGE 0	80.00	2.25	1.80	68.77	
40	PLACE PROJECTILE NEAR NO. 1	80.00	2.25	1.80	70.57	
39	REMOVE GROMMET AND EXAMINE ROTATING BAND FOR DIRT OR BURRS	86.67	2.07	1.79	72.36	
3	REMOVE PAULIN FROM CAB STORAGE RACK AND SPREAD ON GROUND	100.00	1.76	1.76	74.13	
44	REMOVE PROPELLANTS NOT REQUIRED	73.33	2.38	1.75	75.87	35
46	PREPARE AND VERIFY CORRECT CHARGE	73.33	2.37	1.74	77.61	
16	UNLOAD FUZE BOXES AND OPEN AND ARRANGE FUZES	93.33	1.79	1.68	79.29	
22	PLACE VENT CLEANING EQUIPMENT IN A CONVENIENT LOCATION	60.00	2.72	1.63	80.92	
13	PROCURE FUZE SETTER	86.67	1.85	1.61	82.52	
7	DROP THE RIGHT SPADE	80.00	1.99	1.59	84.11	40
49	STAND PROJECTILE ON END AND CLEAN THOROUGHLY	80.00	1.96	1.57	85.68	
48	SELECT PROPER PROJECTILE	73.33	2.09	1.53	87.21	
15	PREPARE TELEPHONE FOR USE AND CHECK OPERATION	73.33	2.07	1.52	88.73	
14	ASSEMBLE AIMING POSTS OR COLLIMATOR	80.00	1.83	1.47	90.19	45
37	VERIFY THAT PROJECTILE IS TYPE DESIGNATED IN CONTAINER	80.00	1.82	1.45	91.65	
19	ASSIST NO. 1 IN INSPECTING AND CLEANING THE BREECH BLOCK, CH	80.00	1.80	1.44	93.09	
12	LAY COMMUNICATION CABLE FROM HOWITZER TO XM-155/GT	66.67	2.00	1.33	94.42	
36	HAND THE PROPELLANT CHARGE TO NO. 1	73.33	1.81	1.32	95.75	
45	TIE REMAINING BAGS TOGETHER	60.00	2.18	1.31	97.06	50
24	RAISE AND SECURE BALLISTIC COVER	60.00	1.62	0.97	98.03	
47	REMOVE SAFETY PULL WIRE FROM TIME FUZES	53.33	1.71	0.91	98.94	
1	OPEN REAR HULL DOORS	100.00	0.88	0.88	99.82	
20	OPEN AND LOCK DIRECT FIRE TELESCOPE WINDOW	66.67	1.18	0.79	100.60	54
29	REMOVE LIFTING PLUG	53.33	1.03	0.55	101.15	

CHIEF OF SECTION

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
11	SELECT CLEARLY DEFINED POINT AT 1500 METERS OR MORE	100.00	2.52	2.52	91.50	
4	DIRECT DRIVER TO CUT ENGINE AND SET BRAKES	100.00	2.27	2.27	93.77	30
12	READ AND RECORD DEFLECTIONS FROM AZIMUTH COUNTER (ALTERNATE	100.00	2.24	2.24	96.01	
33	GIVE FIRE COMMANDS WITH RANGE GIVEN IN FORM OF QUADRANT	66.67	2.99	1.99	98.01	
24	CONDUCT PREARRANGED FIRES	66.67	2.99	1.99	100.00	33

GUNNER

	COUNT OF TASKS LISTED	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	TASK TITLE	%	%	%	N
16	SET ANNOUNCED DEFLECTION ON AZIMUTH COUNTER	100.00	3.26	3.26	3.26	3.26	100.00	3.26	3.26	3.26
10	UNCOVER AZIMUTH 6400-MIL COUNTER AND ZERO GUNNER'S AID COUNT	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	6.48
24	CENTER PITCH - AND - CROSS LEVEL BUBBLES	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	9.71
25	CORRECT FOR DISPLACEMENT WHEN VERTICAL RETICLE IS DISPLACED	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	12.93
33	TRAVERSE HOWITZER UNTIL VERTICAL RETICLE IS CENTERED ON TARG	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	16.15
37	LAY FOR DEFLECTION	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	19.38
39	ELEVATE HOWITZER UNTIL BUBBLE IN PITCH-LEVEL VIAL IS CENTERED	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	22.60
40	CENTER CROSS-LEVEL BUBBLE ON THE PANORAMIC TELESCOPE MOUNT	100.00	3.22	3.22	3.22	3.22	100.00	3.22	3.22	25.82
9	INSTALL PANORAMIC TELESCOPE	100.00	3.02	3.02	3.02	3.02	100.00	3.02	3.02	28.84
34	MAINTAIN SIGHT PICTURE BY CONTINUOUS TRACKING OF TARGET	100.00	3.02	3.02	3.02	3.02	100.00	3.02	3.02	31.87
38	ANNOUNCE RANGE AND SET ELEVATION QUADRANT	100.00	3.02	3.02	3.02	3.02	100.00	3.02	3.02	34.89
11	SET AZIMUTH COUNTER TO 3200 MILS	100.00	2.99	2.99	2.99	2.99	100.00	2.99	2.99	37.88
18	CHECKS THAT PITCH - AND - CROSS LEVEL BUBBLES ARE CENTERED	100.00	2.95	2.95	2.95	2.95	100.00	2.95	2.95	40.84
28	ELEVATE TUBE UNTIL ELEVATION-LEVEL BUBBLE IS CENTERED	100.00	2.95	2.95	2.95	2.95	100.00	2.95	2.95	43.79
12	LEVEL TELESCOPE MOUNT	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	46.51
15	IDENTIFY AIMING POINT THROUGH TELESCOPE	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	49.24
21	SET AND LAY FOR DEFLECTION	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	51.96
22	SET ANNOUNCED DEFLECTION ON RESET COUNTER	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	54.69
23	TRAVERSE PIECE UNTIL VERTICAL RETICLE OF TELESCOPE IS ON LEF	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	57.41
29	REFER PIECE	100.00	2.72	2.72	2.72	2.72	100.00	2.72	2.72	60.13
13	TEST AND ALIGN (BORESIGHT) FIRE CONTROL EQUIPMENT	100.00	2.69	2.69	2.69	2.69	100.00	2.69	2.69	62.82
14	LAY HOWITZER FOR DIRECTION	100.00	2.69	2.69	2.69	2.69	100.00	2.69	2.69	65.50
19	DIRECT ALIGNMENT OF AIMING POSTS AND/OR COLLIMATOR	100.00	2.69	2.69	2.69	2.69	100.00	2.69	2.69	68.19
20	LAY ON ALTERNATE AIMING POINT	100.00	2.52	2.52	2.52	2.52	100.00	2.52	2.52	70.71
31	ACTUATE CLICK SIGHT MECHANISM	100.00	2.52	2.52	2.52	2.52	100.00	2.52	2.52	73.24

GUNNER

(cont'd)

TASK	TASK TITLE	%	%	%	%	N
32	SET INITIAL LEAD ON AZIMUTH COUNTER	100.00	2.46	2.46	75.69	
5	CHECK CAB HYDRAULIC SYSTEM POWER PACK PRESSURE	66.67	3.51	2.32	78.04	
17	TRAVERSE CAB UNTIL RETICLE PATTERN OF TELESCOPE IS CENTERED	100.00	2.26	2.26	80.29	
27	PLACE ANNOUNCED QUADRANT ON THE ELEVATION COUNTER	100.00	2.26	2.26	82.55	
30	PREPARE PANORAMIC TELESCOPE FOR DIRECT LAYING	100.00	2.26	2.26	84.80	30
36	TURN AZIMUTH KNOB IN 5-MIL INCREMENTS TO SET LEAD CHANGES AS	100.00	2.22	2.22	87.02	
3	SELECT NO. 1 GUNNER FOR POWER ELEVATION	66.67	3.11	2.07	89.09	
7	CHECK FUNCTIONING OF TRAVERSING MECHANISM	66.67	2.93	1.96	91.05	
26	PLACE GUNNER'S ELEVATING CONTROL SWITCH TO GUNNER	66.67	2.81	1.87	92.92	
4	CHECK EQUILIBRATOR FLUID LEVEL	66.67	2.70	1.80	94.73	35
8	COMMAND DRIVER TO LIFT AND LOCK BALLISTIC COVER	66.67	2.11	1.41	96.13	
2	PLACE CAB POWER SWITCH TO ON	66.67	2.00	1.34	97.47	
35	GIVE COMMAND "FIRE"	66.67	1.78	1.19	98.66	
1	RELEASE CAB TRAVERSE LOCK	33.33	2.42	0.81	99.46	
6	ASSIST DRIVER IN DISENGAGING TRAVELING LOCK	33.33	1.61	0.54	100.00	40

ASSISTANT GUNNER

TASK	TASK TITLE	COUNT OF TASKS LISTED				CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS				N
		ORDERED BY ---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	%	%	%	%	
15	INSURE APPROPRIATE SETTINGS ON ELEVATING QUADRANT					100.00	5.66	5.66	5.66	5
16	INSURE BUBBLES ARE CENTERED					100.00	5.66	5.66	11.32	
21	PREPARE DIRECT FIRE TELESCOPE					100.00	5.66	5.66	16.99	
27	ELEVATE OR DEPRESS PIECE UNTIL APPROPRIATE RANGE LINE IS ON					100.00	5.66	5.66	22.65	
2	CHECK FUNCTIONING OF ELEVATING MECHANISMS					100.00	5.26	5.26	27.91	
4	INSURE CROSS-LEVEL BUBBLE IS CENTERED					100.00	5.02	5.02	32.93	
3	DEPRESS OR ELEVATE TUBE TO LOADING ELEVATION					100.00	4.64	4.64	37.56	
12	SET ANNOUNCED QUADRANT ON ELEVATION COUNTER WITH ELEVATION					100.00	4.46	4.46	42.02	
17	CALLS "SET" WHEN PIECE HAS BEEN LAID FOR RANGE					100.00	4.46	4.46	46.48	
24	ELEVATE OR DEPRESS PIECE UNTIL TARGET IS ON APPROPRIATE RANGE					100.00	4.46	4.46	50.94	10
1	ELEVATE TUBE CLEAR OF HOWITZER TRAVELING LOCK					100.00	4.32	4.32	55.25	
14	ELEVATE PIECE TO ANNOUNCED QUADRANT AFTER LOADING					100.00	4.06	4.06	59.31	
5	SET CORRECTION COUNTER TO ZERO					100.00	3.72	3.72	63.03	
10	CENTER CANT CORRECTION BUBBLE					100.00	3.51	3.51	66.54	15
7	CHECK DIRECT FIRE TELESCOPE					100.00	3.32	3.32	69.86	
11	VERIFY THAT ELEVATION AND AZIMUTH SLIP SCALES ARE SET AT 4					100.00	3.32	3.32	73.18	
8	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION					100.00	3.00	3.00	76.18	
22	ADJUST LIGHT CONTROL KNOB FOR OPTIMUM RETICLE ILLUMINATION					100.00	3.00	3.00	79.18	
13	PLACE TUBE AT LOADING POSITION, DEPENDING ON TYPE OF RAMMER					100.00	2.92	2.92	82.10	20
18	PLACE TUBE AT LOADING POSITION AFTER EACH ROUND IS FIRED, DE					100.00	2.92	2.92	85.02	
26	MAINTAIN TARGET ON APPROPRIATE RANGE LINE BY CONTINUOUS TRAC					100.00	2.92	2.92	87.94	
6	ASSIST CHIEF OF SECTION IN MEASURING SITE TO CREST					100.00	2.52	2.52	90.45	
9	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING					66.67	3.35	2.23	92.68	
23	ADJUST LEVEL VIAL MIRROR FOR CONVENIENT VIEWING					66.67	3.35	2.23	94.92	25
25	CHECK LEVEL VIAL MIRROR AND ADJUST FOR CANT TO CENTER BUBBLE					66.67	3.35	2.23	97.15	
19	CLEAN OBTURATOR VENT AND PRIMER SEAT					66.67	2.14	1.43	98.57	27
20	SWAB OUT BORE, WASH POWDER RESIDUE FROM OBTURATOR HEAD, THE					66.67	2.14	1.43	100.00	

TASK	TASK TITLE	COUNT OF TASKS LISTED				CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS				N
		ORDERED BY ---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	ORDERED BY ---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	
9	PLACE PROJECTILE IN LOADING TRAY OF POWER RANGHER		75.00	21.85	16.38		16.38	16.38		
10	MOVE RANGHER CYLINDER TO RAM POSITION		75.00	14.11	10.58		10.58	26.96		
11	RETURN RANGHER TO STOWED POSITION		75.00	14.11	10.58		10.58	37.54		
7	LOWER RANGHER TO OPERATING POSITION		75.00	12.02	9.02		9.02	46.56		
4	INSPECT, OPERATE, AND CLEAN BREECH BLOCK, RANGHER, CHAMBER, SWAB AND INSPECT THE POWDER CHAMBER		75.00	11.96	8.97		8.97	55.54	5	
17	PROCURE SPONGE, BUCKLAP, AND BUCKET OF WATER AND PLACE IN CON		50.00	12.14	6.07		6.07	61.61		
5	RELEASE RANGHER CYLINDER LATCH		50.00	11.14	5.57		5.57	67.18		
8	REMOVE LEFT SPADE STREET SAFETY PIN, RELEASE LOCKING LATCH,		25.00	20.00	5.00		5.00	72.18		
2	CALL OUT NUMBER AND QUADFANT FOR EACH ROUND IN VOLLEY FIRE		50.00	9.36	4.68		4.68	76.86		
18	PLACE PROPELLANT CHARGE IN CHAMBER		25.00	17.86	4.46		4.46	81.32	10	
12	INSERT PRIMER IN PRIMER CHAMBER, CLOSE BLOCK ASSEMBLY, AND		50.00	6.79	3.39		3.39	84.71		
14	OPERATE FIRING MECHANISM		50.00	6.79	3.39		3.39	88.11		
3	PROCURE PRIMERS AND PLACE IN CONVENIENT LOCATION		25.00	10.00	2.50		2.50	90.61		
6	ATTACH FIRING LANTARD TO FIRING MECHANISM LEVER		25.00	10.00	2.50		2.50	93.11		
15	MOMARD "CLOSE" AND CLOSE THE BREECH		25.00	10.00	2.50		2.50	95.61	15	
16	FIRE BOLLIZER ON CLAYD		50.00	4.79	2.39		2.39	98.00		
19			25.00	8.00	2.00		2.00	100.00	17	

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HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA
TASK ANALYSES OF THREE SELECTED WEAPONS SYSTEMS. (U)
OCT 76 T R POWERS, M R MCCLUSKEY

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8-In Howitzer

CANNONEERS NOS. 2-6 AND DRIVER

TASK	TASK TITLE	COUNT OF TASKS LISTED										N
		CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS										
		ORDERED BY --- AVERAGE PERCENT PART OF JOB BY ALL MEMBERS										
		AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING										
9	ASSIST NO. 2 IN UNLOADING FUZE BOXES AND OPENING AND ARRANG	90.00	3.97	3.57	3.57	3.57	3.57	3.57	3.57	3.57	3.57	5
10	UNLOAD AND ARRANGE PROJECTILES	80.00	4.12	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	5
6	ASSIST NO. 4 AND 5 IN UNLOADING AND ARRANGING AMUNITION	100.00	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	10
16	UNLOAD FUZE BOXES AND OPEN AND ARRANGE FUZES	80.00	3.77	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	15
17	REMOVE MUZZLE PLUG	80.00	3.67	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	15
14	ASSEMBLE AIMING POSTS OR COLLIMATOR	90.00	3.12	2.81	2.81	2.81	2.81	2.81	2.81	2.81	2.81	20
52	HOLD PROJECTILE WHILE NO. 2 FUZES AND SETS FUZE	90.00	3.03	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	25
19	ASSIST NO. 1 IN INSPECTING AND CLEANING THE BREECH BLOCK, CH	90.00	2.89	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	25
48	SELECT PROPER PROJECTILE	70.00	3.71	2.59	2.59	2.59	2.59	2.59	2.59	2.59	2.59	10
11	UNLOAD AND ARRANGE PROPELLING CHARGES	70.00	3.67	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	10
20	OPEN AND LOCK DIRECT FIRE TELESCOPE WINDOW	70.00	3.51	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	15
13	PROCURE FUZE SETTER	70.00	3.46	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	15
34	ASSIST NO. 3 AND 4 IN PREPARING AMUNITION	70.00	3.44	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	15
2	BACK CARRIAGE AGAINST SPADES	100.00	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	15
25	UNLOAD AIMING POSTS, RAMMER STAFF SECTIONS AND PIONEER EQUIP	70.00	3.23	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	15
26	ASSEMBLE RAMMER STAFF AND HEAD	70.00	3.17	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	15
8	SET BRAKE AND STOP ENGINE	60.00	3.51	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	20
23	LOWER AND SECURE HOWITZER TRAVELING LOCK	60.00	3.48	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	20
18	EXPLACE AND HOLD TESTING TARGET	80.00	2.58	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	20
21	SET OUT AIMING POSTS	70.00	2.90	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	20
12	LAY COMMUNICATION CABLE FROM HOWITZER TO XM-155/GT	70.00	2.84	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	20
32	CARRY PROJECTILE TO HOWITZER	60.00	3.30	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98	25
27	PLACE INSTRUMENT PANEL INSIDE DRIVER'S COMPARTMENT AND CLOSE	60.00	3.25	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	25
30	ASSIST NO. 5 IN PREPARING THE PROPELLANT CHARGE	70.00	2.77	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	25
5	UNLOAD AND ARRANGE EQUIPMENT AS DIRECTED BY THE CHIEF OF SEC	80.00	2.42	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	25
43	EXAMINE ENTIRE PROJECTILE FOR DEFECTS	80.00	2.42	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	25
24	RAISE AND SECURE BALLISTIC COVER	60.00	3.20	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	25

CANNONEERS NOS. 2-6 AND DRIVER

(cont'd)

TASK	TASK TITLE	Z	Z	Z	Z	N
45	TIE REMAINING BAGS TOGETHER	70.00	2.66	1.86	67.28	
40	PLACE PROJECTILE NEAR NO. 1	80.00	2.30	1.84	69.12	
39	REMOVE GROMMET AND EXAMINE ROTATING BAND FOR DIRT OR BURRS	70.00	2.53	1.77	70.89	30
51	REMOVE IGNITER PROTECTOR CAP FROM BASE CHARGE	50.00	3.49	1.75	72.64	
50	SET TIME FUZES USING APPROPRIATE FUZE SETTER	60.00	2.90	1.74	74.38	
53	SET SUPERQUICK AND DELAY FUZES WITH FUZE WRENCH	60.00	2.88	1.73	76.11	
54	READ AND ANNOUNCE TIME SET ON FUZE	50.00	3.40	1.70	77.81	
36	HAND THE PROPELLANT CHARGE TO NO. 1	60.00	2.75	1.65	79.46	35
7	DROP THE RIGHT SPADE	60.00	2.59	1.50	81.00	
38	SELECT CHARGE DESIGNATED BY XO	60.00	2.52	1.51	82.52	
33	PREPARE PROPELLANT CHARGE	50.00	2.83	1.41	83.93	
31	INSPECT AND CLEAN PROJECTILES	60.00	2.31	1.39	85.32	
35	INSPECT FUZE WELL FOR RUST AND DIRT	60.00	2.30	1.38	86.70	40
28	SECURE DRIVER'S HATCH	60.00	2.29	1.37	88.07	
3	REMOVE PAULIN FROM CAB STORAGE RACK AND SPREAD ON GROUND	100.00	1.36	1.36	89.44	
46	PREPARE AND VERIFY CORRECT CHARGE	50.00	2.72	1.36	90.80	
37	VERIFY THAT PROJECTILE IS TYPE DESIGNATED IN COMMAND	50.00	2.41	1.20	92.00	
4	ASSIST NO. 3 IN PREPARING PAULIN	100.00	1.15	1.15	93.15	45
49	STAND PROJECTILE ON END AND CLEAN THOROUGHLY	50.00	2.12	1.06	94.21	
15	PREPARE TELEPHONE FOR USE AND CHECK OPERATION	60.00	1.74	1.04	95.25	
42	ATTACH DESIGNATED FUZE	50.00	2.04	1.02	96.27	
44	REMOVE PROPELLANTS NOT REQUIRED	50.00	1.95	0.98	97.25	50
29	REMOVE LIFTING PLUG	50.00	1.91	0.95	98.20	
1	OPEN REAR HULL DOORS	100.00	0.90	0.90	99.10	
47	REMOVE SAFETY PULL WIRE FROM TIME FUZES	40.00	2.01	0.81	99.90	
22	PLACE VENT CLEANING EQUIPMENT IN A CONVENIENT LOCATION	60.00	1.26	0.75	100.66	
41	REMOVE COMPLETE CHARGE FROM CONTAINER, PLACING BASE CHARGE O	50.00	1.48	0.74	101.40	54

[illegible]**TASK TITLE**

TASK

5 SPOT CHECK LAY OF MORTAR

4 SPOT CHECK SETTINGS PLACED ON SIGHT

4 SPUI CHECK SETTING 1 LINE
3 REIAY/RECORD FIRE COMMANDS

3 RELAY/RECORD FINE COMMANDS
1 DESIGNATE EVACT LOCATION MORTAR IS TO BE MOUNTED

2 INDICATE INITIAL DIRECTION OF FIRE

100.00	27.95	27.95	27.95
90.00	25.17	22.65	50.60
80.00	22.45	17.96	68.56
80.00	21.75	17.40	85.96
80.00	17.55	14.04	100.00

4.2

GUNNER

(cont'd)

TASK	TASK TITLE	Z	Z	Z	Z	N
29	LAY MORTAR FOR FINAL PROTECTIVE FIRE (FPF) DEFLECTION AND EL	85.71	2.80	2.40	91.46	
33	ASSIST IN MAINTAINING MORTAR	85.71	2.66	2.28	93.74	
27	ATTEMPT TO FIRE MISFIRE	71.43	2.96	2.11	95.85	30
1	CARRY MORTAR MOUNT	85.71	2.19	1.88	97.73	
6	CALIBRATE SIGHT FOR ELEVATION USING M2 COMPASS	57.14	2.69	1.54	99.27	
16	DETERMINE, BY REFERENCE TO FIRING TABLE, ELEVATION AND CHARGE	57.14	2.36	1.35	100.00	33

ASSISTANT GUNNER

TASK	TASK TITLE	COUNT OF TASKS LISTED									
		ORDERED BY	---	AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	...	CUMULATIVE AVERAGE PERCENT PART OF JOB BY ALL MEMBERS	...	AVERAGE PERCENT PART OF JOB BY MEMBERS PERFORMING	...	PERCENT OF MEMBERS PERFORMING	N
1	PERFORM PRE-MOUNT CHECKS ON BARREL			100.00	8.63	8.63	8.63	100.00	8.63	8.63	5
6	LOAD ROUND INTO BARREL			100.00	8.63	8.63	17.26	100.00	8.63	17.26	
8	ASSIST GUNNER IN REMOVING MISFIRE			100.00	8.63	8.63	25.89	100.00	8.63	25.89	
9	PASS MISFIRED ROUND TO 1ST AMMUNITION HANDLER			100.00	8.63	8.63	34.52	100.00	8.63	34.52	
10	ASSIST GUNNER IN MOVING MOUNT AND BARREL WHEN LARGE DEFLECTION			100.00	8.63	8.63	43.15	100.00	8.63	43.15	
12	ASSIST IN DISMOUNTING MORTAR			100.00	8.63	8.63	51.79	100.00	8.63	51.79	
13	ASSIST IN MAINTAINING MORTAR			100.00	8.63	8.63	60.42	100.00	8.63	60.42	
2	PARTICIPATE IN MOUNTING MORTAR			100.00	7.74	7.74	68.15	100.00	7.74	68.15	
3	PERFORM BEFORE-FIRING SAFETY CHECK ON BARREL			100.00	7.74	7.74	75.89	100.00	7.74	75.89	
11	SWAB BARREL BORE ON COMPLETION OF FIRE MISSION			100.00	6.96	6.96	82.86	100.00	6.96	82.86	10
4	SWAB BARREL BORE BEFORE FIRING BEGINS			100.00	6.90	6.90	89.76	100.00	6.90	89.76	
5	CHECK ROUND RECEIVED FROM 1ST AMMUNITION HANDLER FOR PROPER			100.00	5.95	5.95	95.71	100.00	5.95	95.71	
7	SWAB BARREL BORE AFTER EACH 10 ROUNDS FIRED			100.00	4.29	4.29	100.00	100.00	4.29	100.00	13

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